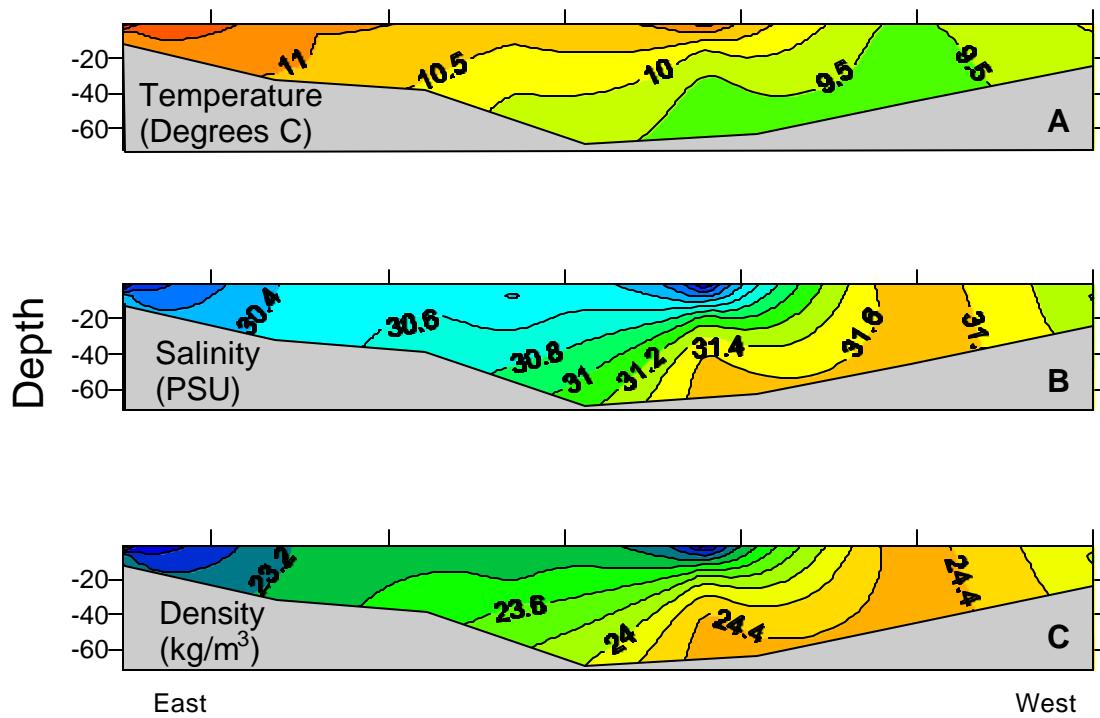
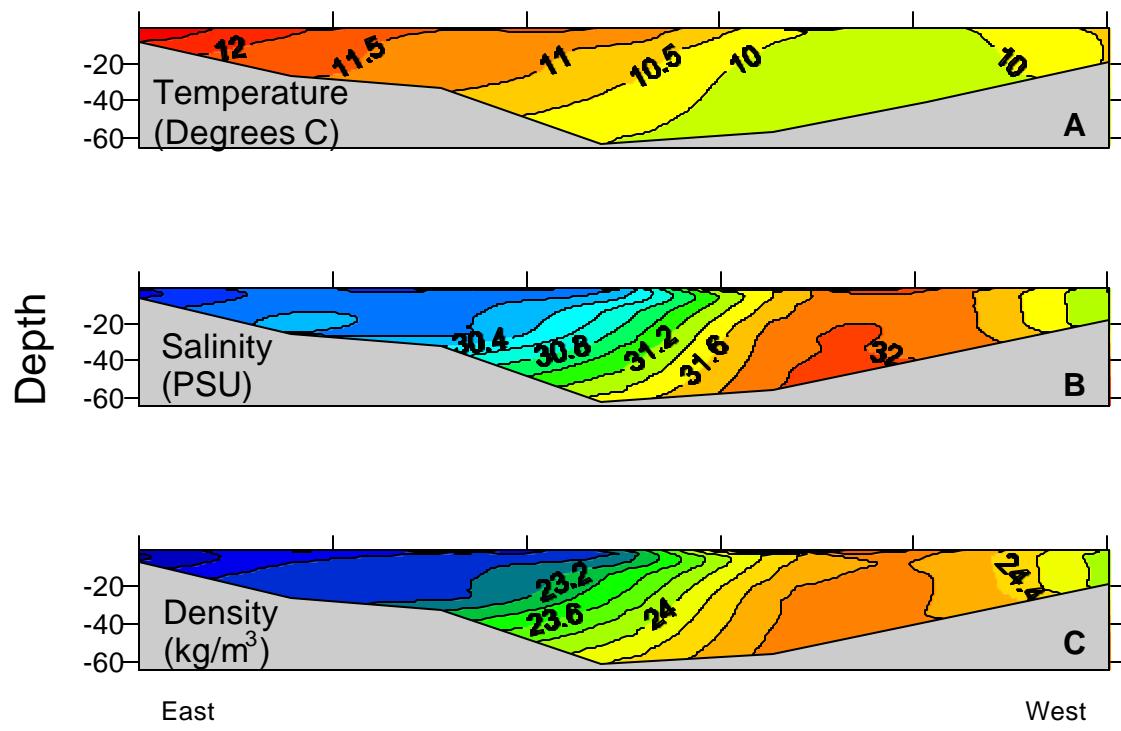


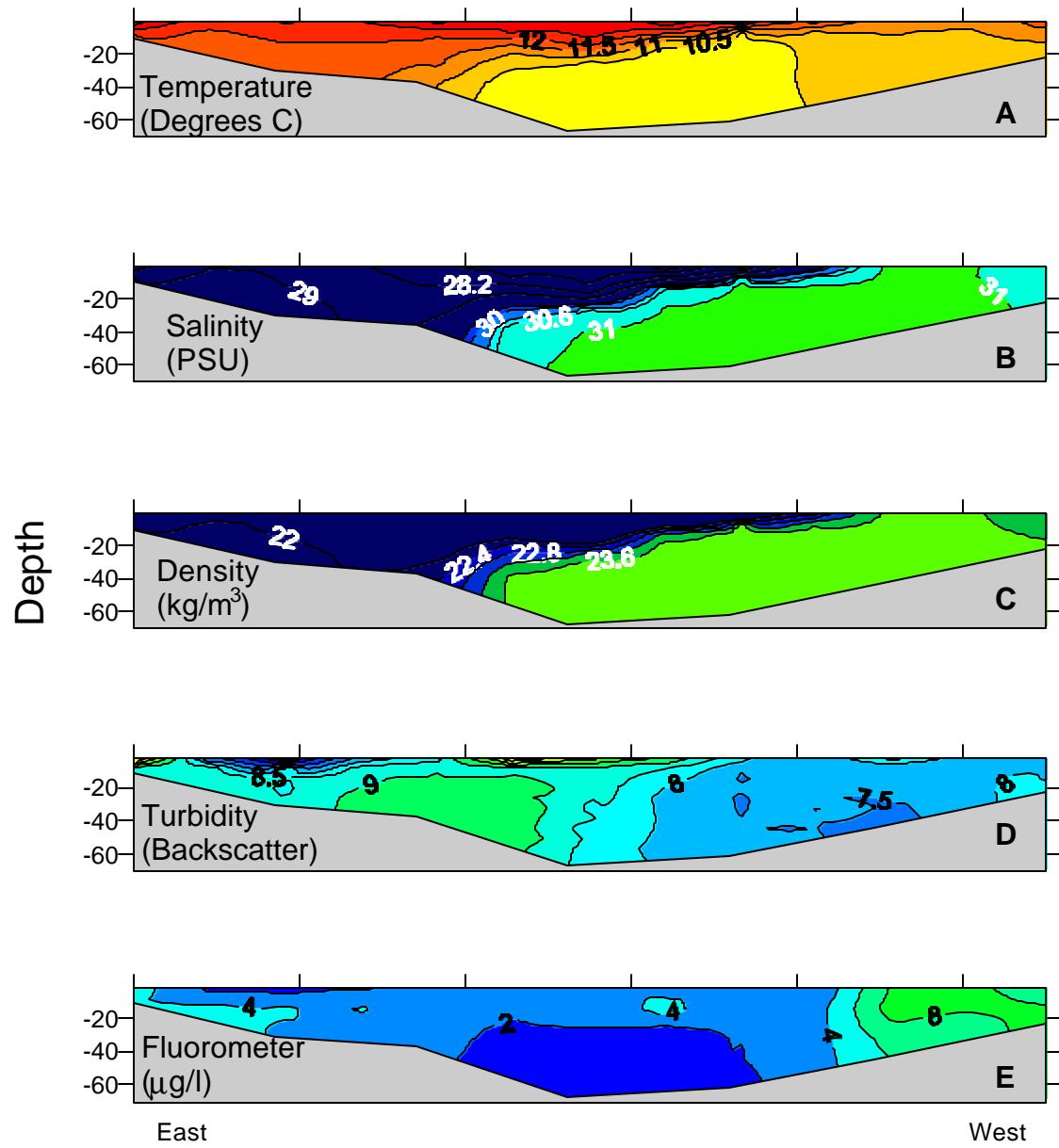
Appendix 2.1. Temperature (A), salinity (B), and density (C) profiles across Cook Inlet (transect A). Data from 8 stations were collected in August of 1995.



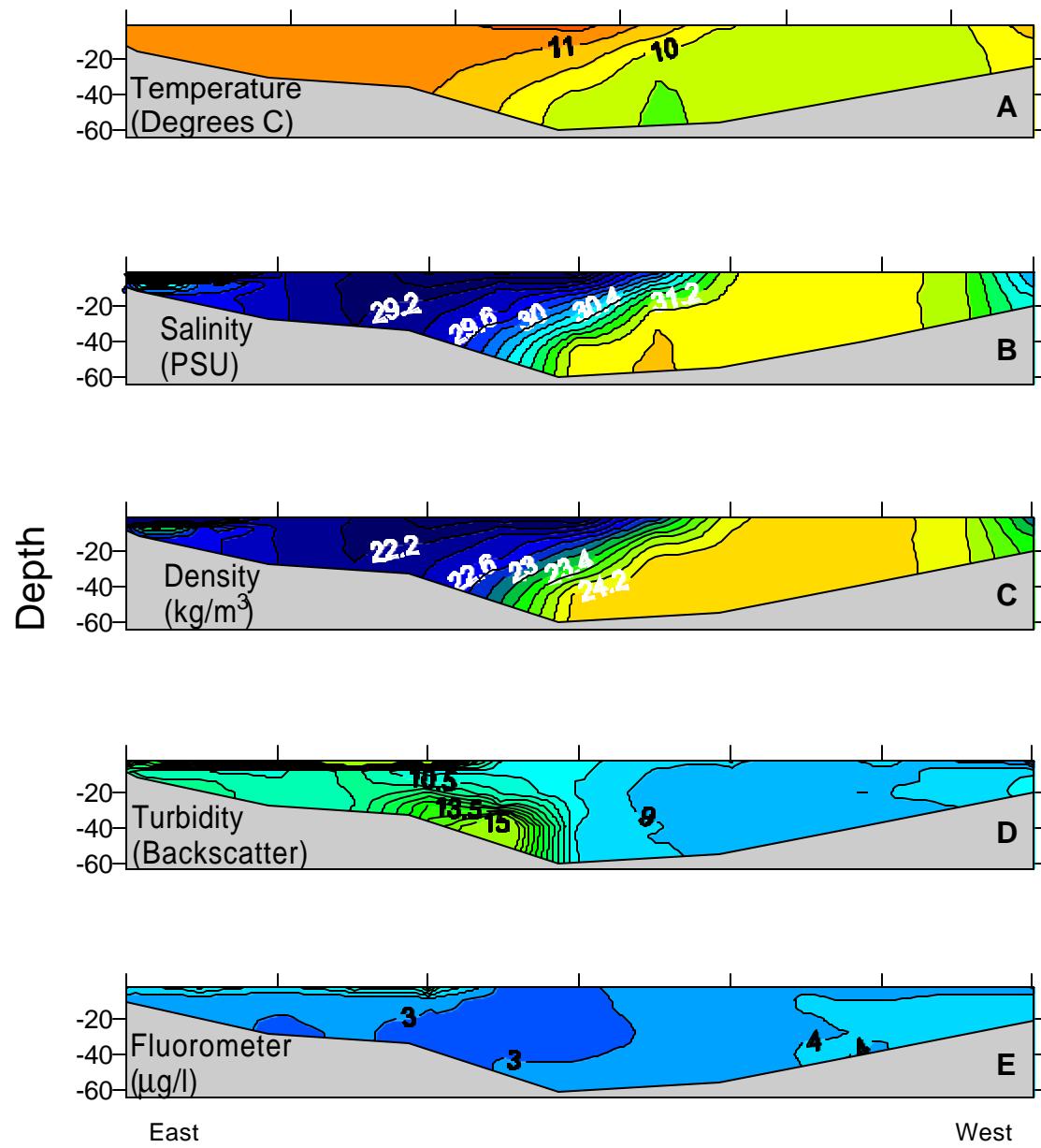
Appendix 2.2. Temperature (A), salinity (B), and density (C) profiles across Cook Inlet (transect A). Data from 6 stations were collected in July of 1996.



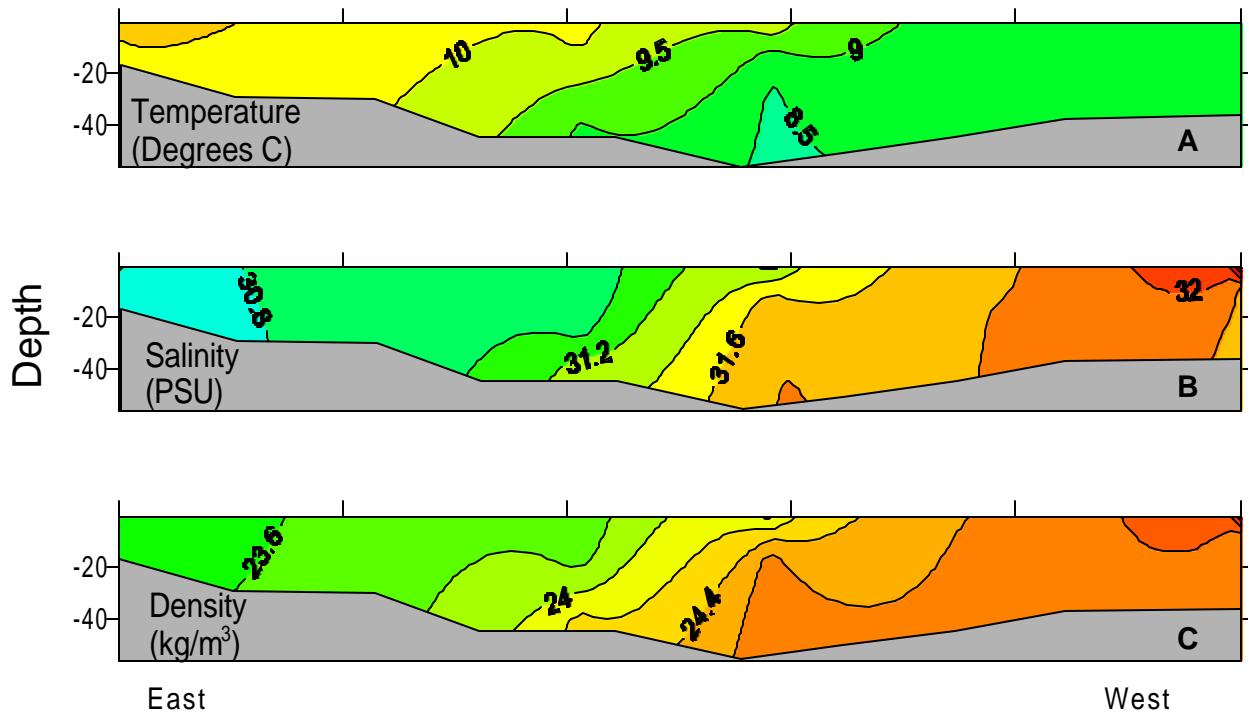
Appendix 2.3. Temperature (A), salinity (B), and density (C) profiles across Cook Inlet (transect A). Data from 7 stations were collected in July of 1997.



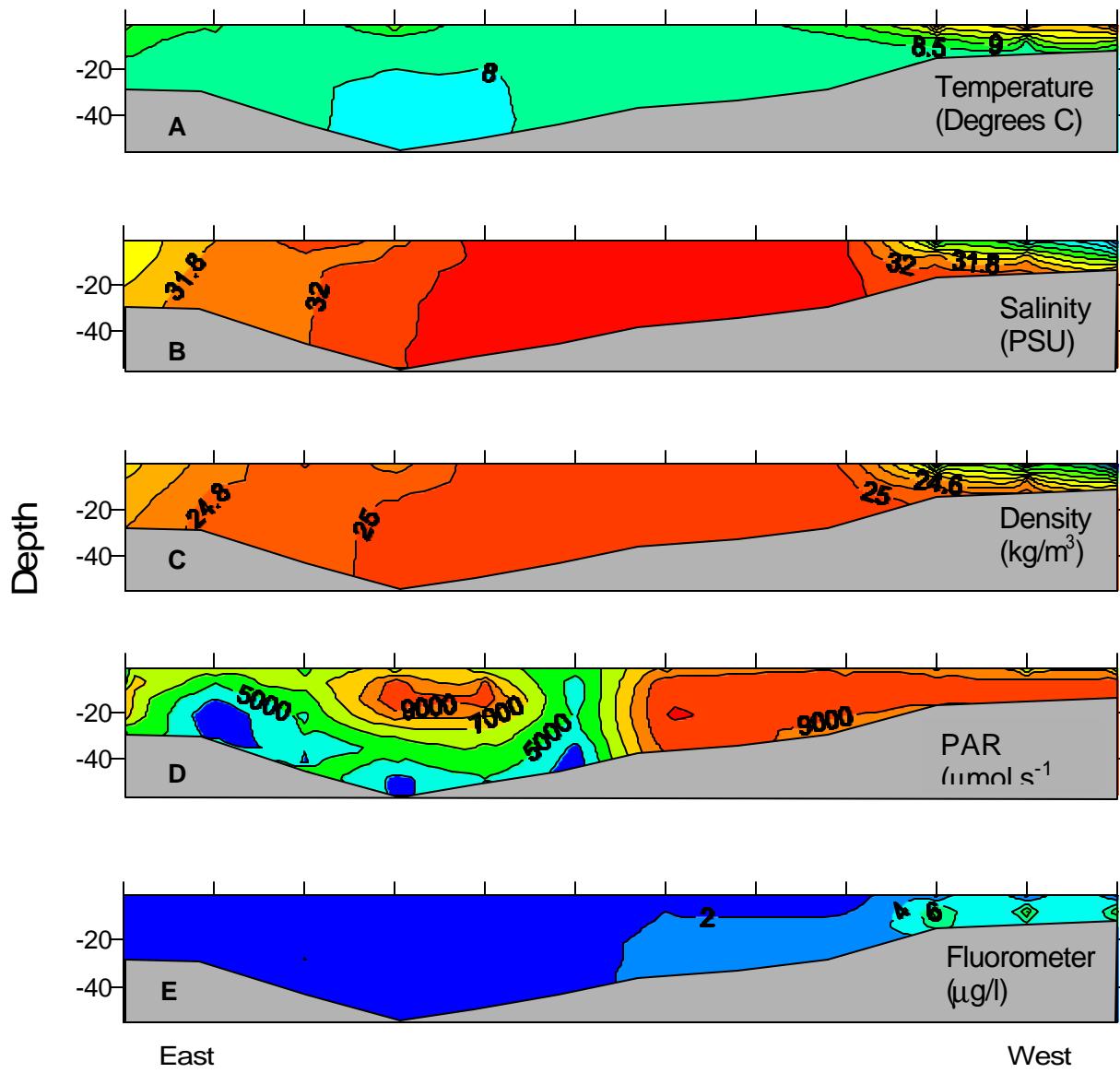
Appendix 2.4. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometry (E) profiles across Cook Inlet (transect A). Data from 13 stations were collected in August of 1998.



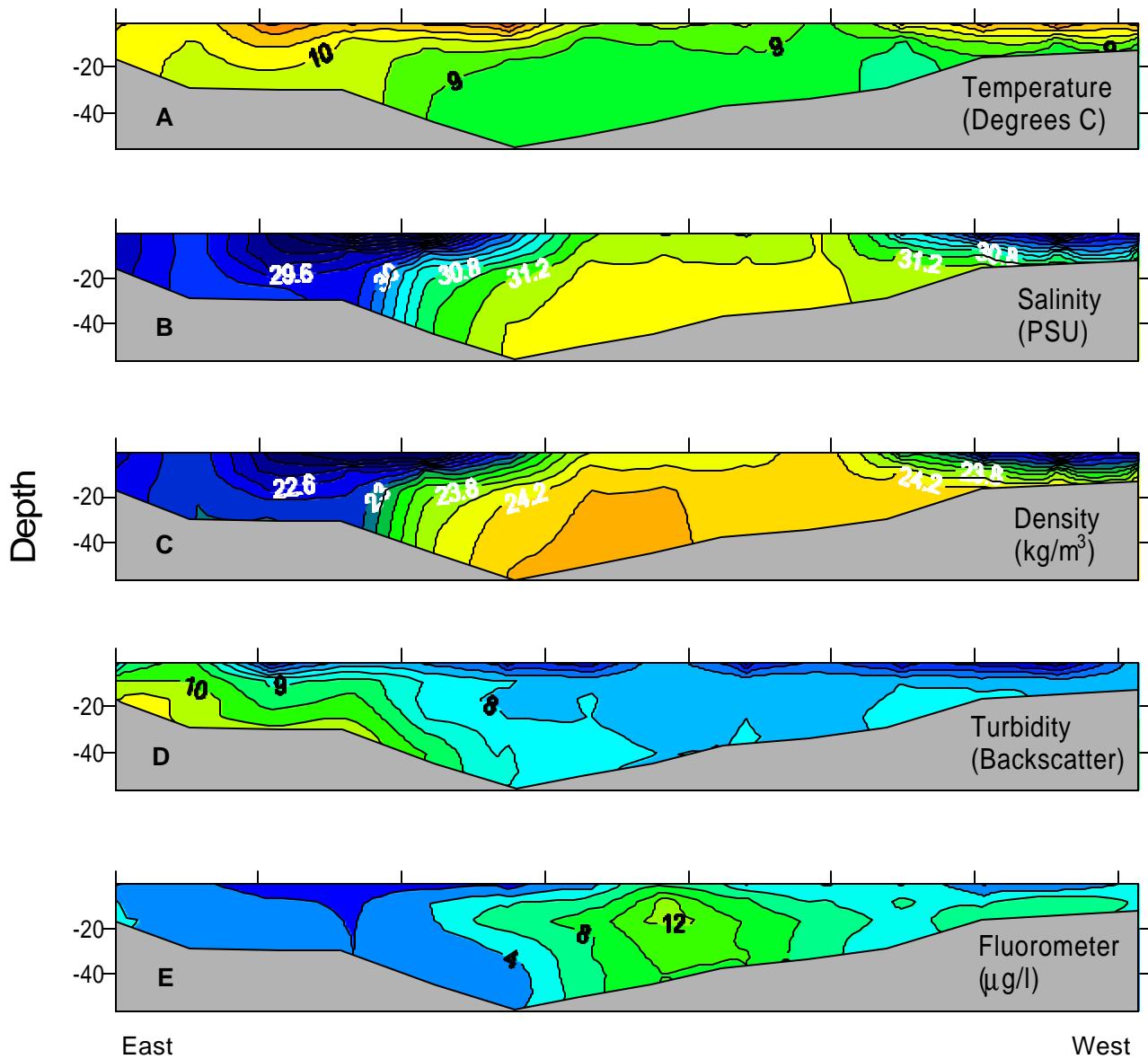
Appendix 2.5. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometry (E) profiles across Cook Inlet (transect A). Data from 13 stations were collected in August of 1999.



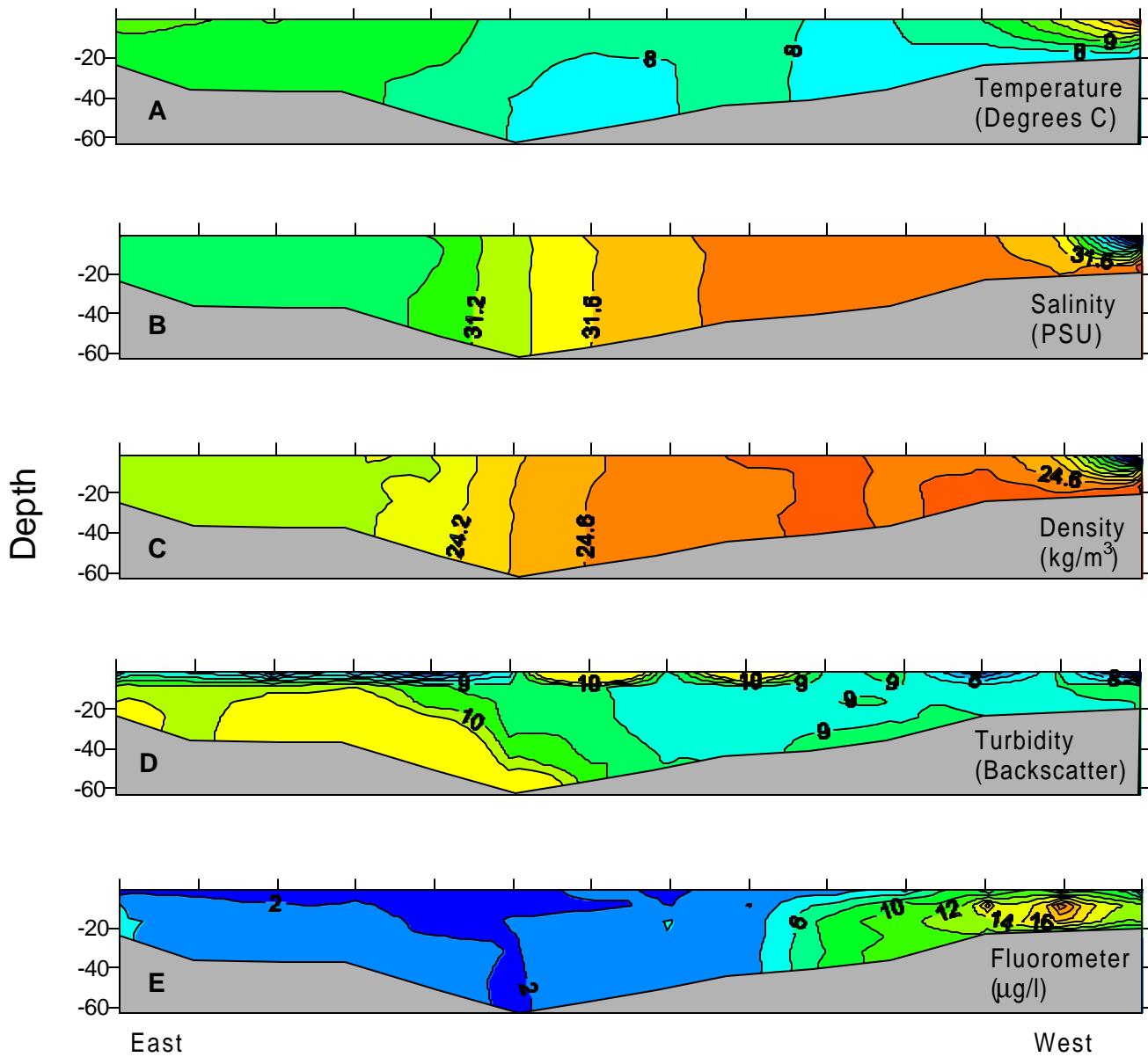
Appendix 2.6. Temperature (A), salinity (B), and density (C) profiles across Lower Cook Inlet (transect B). The transect ran from Kamishak Bay in the West, to the South shore of Kachemak Bay near Seldovia. Data from 12 stations were collected in August of 1996.



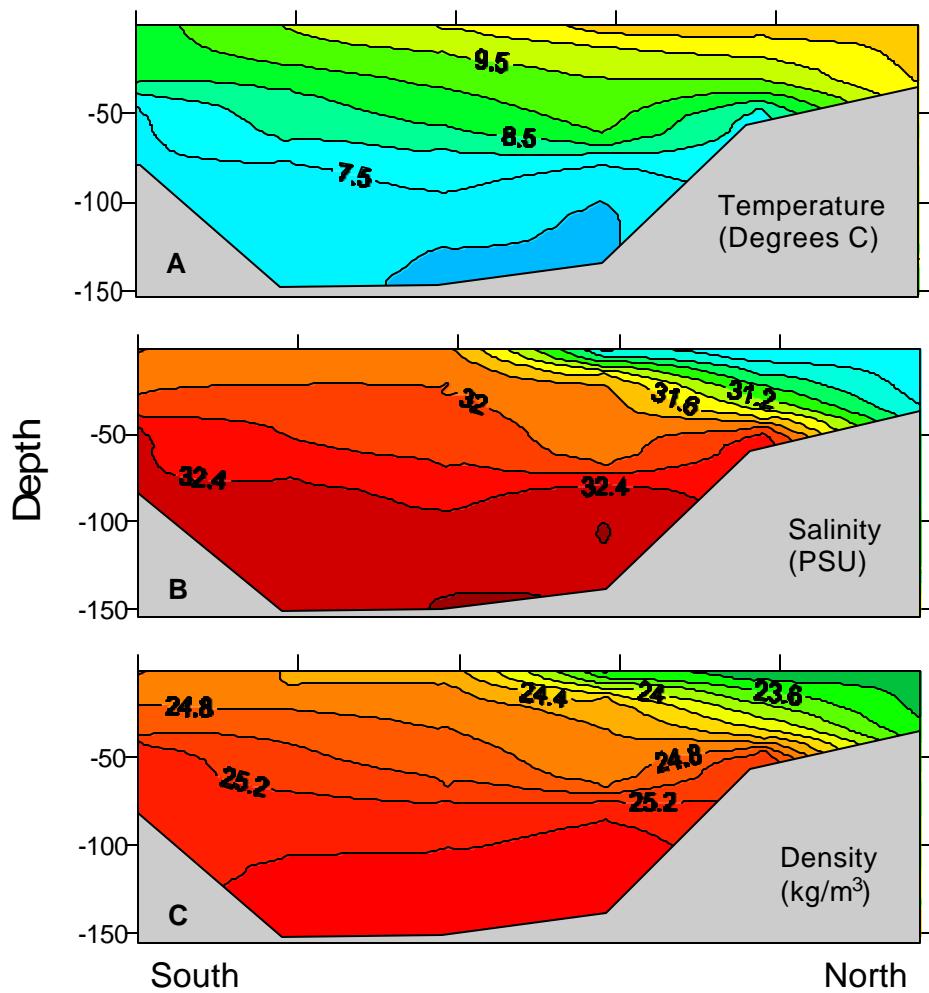
Appendix 2.7. Temperature (A), salinity (B), and density (C), photosynthetically active radiation (PAR), and fluorometer (E) profiles across Lower Cook Inlet. The transect ran from 10 km East of Kamishak Bay in the West, to outer Kachemak Bay (West of the Homer Spit) in the East. Data from 12 stations were collected in August of 1997 (transect B). Note these data were collected with a CTD that included both a fluorometer and PAR sensor.



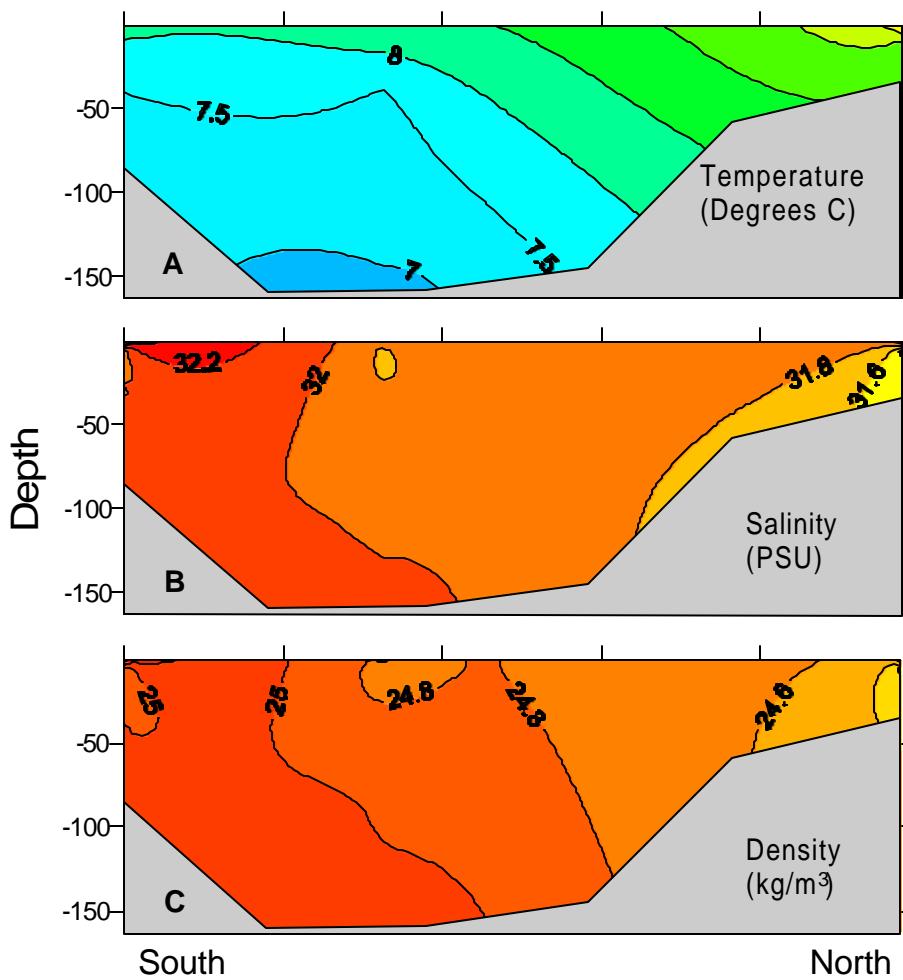
Appendix 2.8. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometer (E) profiles across Lower Cook Inlet. The transect ran from Kamishak Bay in the West, to outer Kachemak Bay (West of the Homer Spit) in the East (transect B). Data from 14 stations were collected in August of 1998.



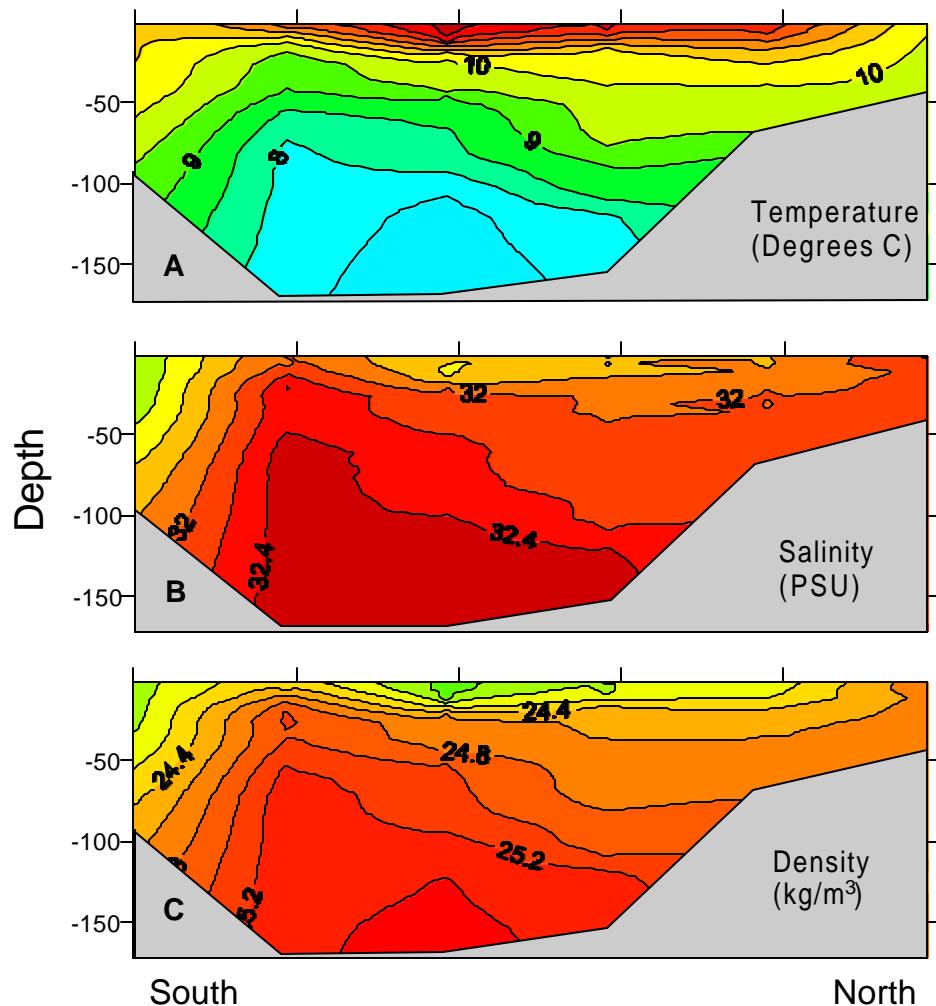
Appendix 2.9. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometer (E) profiles across Lower Cook Inlet. The transect ran from Kamishak Bay in the West, to outer Kachemak Bay (West of the Homer Spit) in the East (transect B). Data from 14 stations were collected in August of 1999.



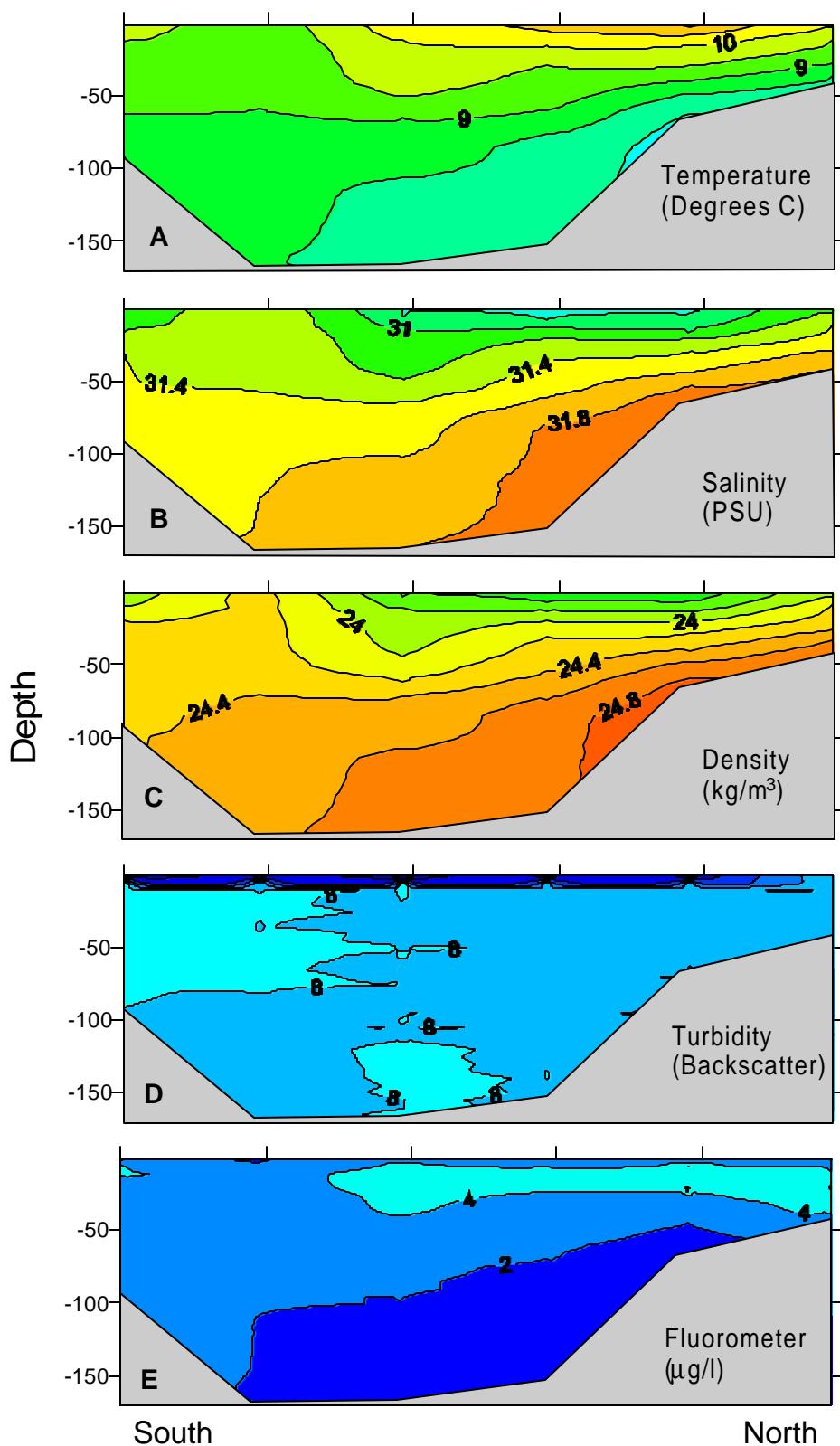
Appendix 2.10. Temperature (A), salinity (B), and density (C) profiles across Kennedy Entrance in lower Cook Inlet. This transect ran from the Barren Islands in the South to the Kenai Peninsula in the North (transect C). Data from 6 stations were collected in August of 1995.



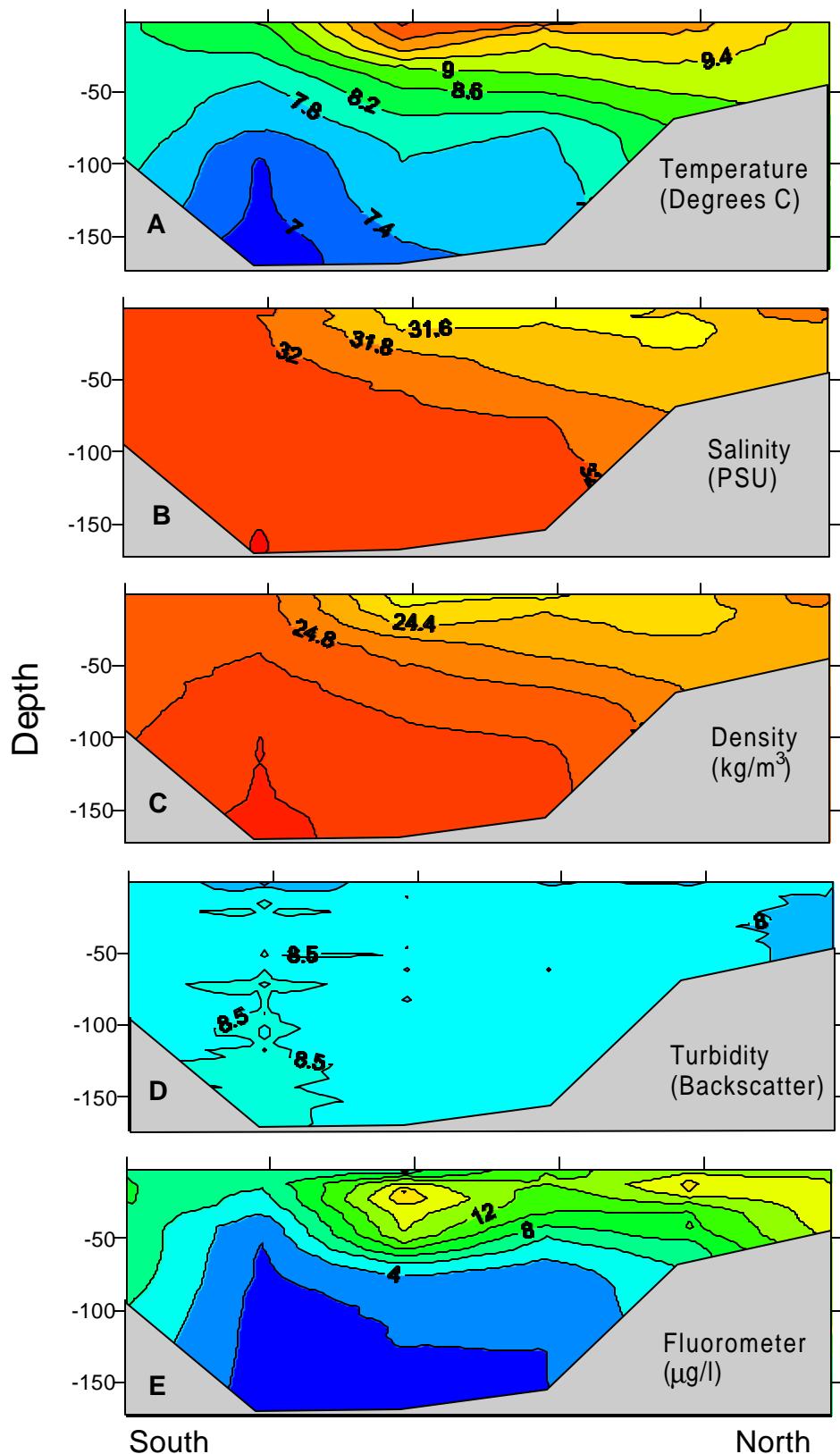
Appendix 2.11. Temperature (A), salinity (B), and density (C) profiles across Kennedy Entrance in lower Cook Inlet. This transect ran from the Barren Islands in the South to the Kenai Peninsula in the North. Data from 4 stations were collected in August of 1996 (transect C). Note that in 1996 the complete transect was not run. In particular the sampling in the center of the transect was sparse.



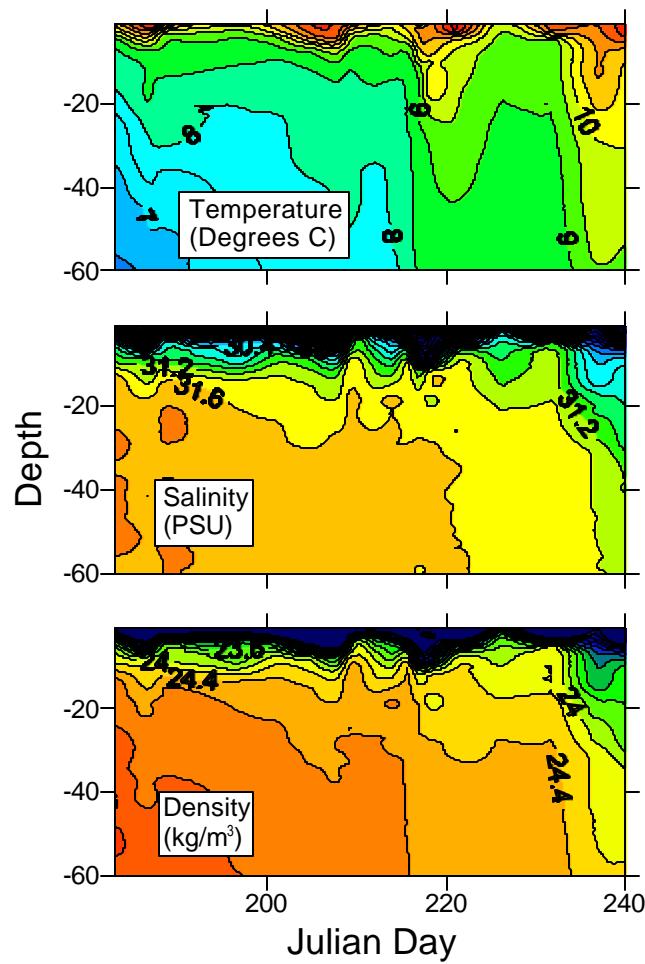
Appendix 2.12. Temperature (A), salinity (B), and density (C) profiles across Kennedy Entrance in lower Cook Inlet. This transect ran from the Barren Islands in the South to the Kenai Peninsula in the North (transect C). Data from 6 stations were collected in August of 1997.



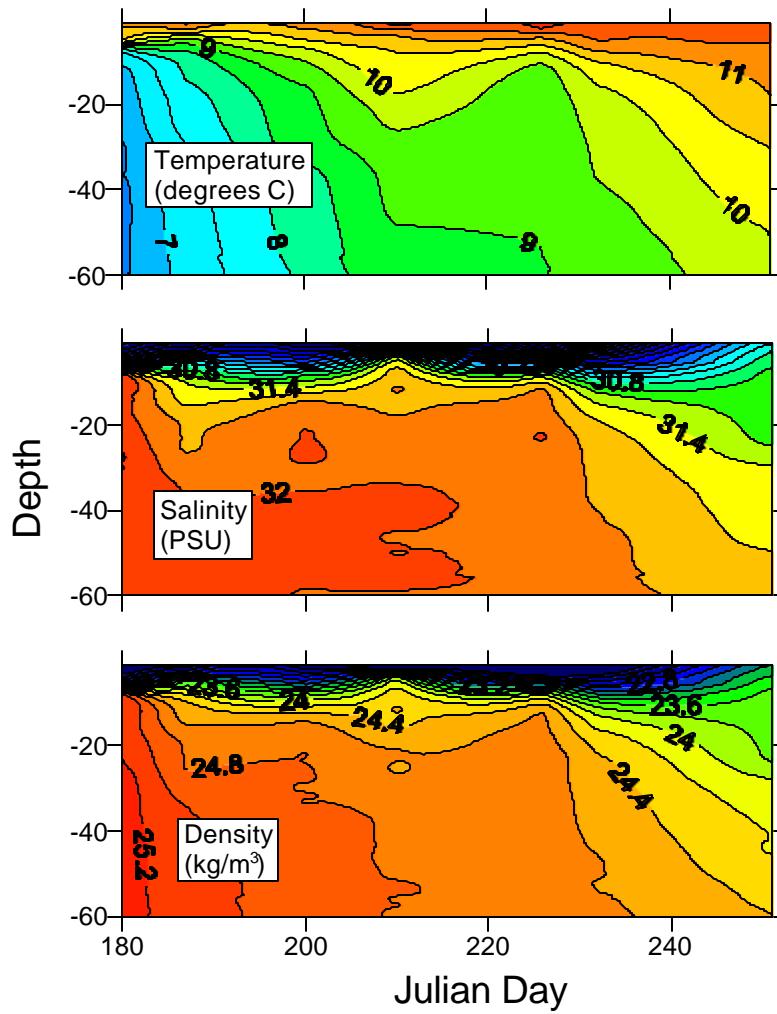
Appendix 2.13. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometry (E) profiles across Kennedy Entrance in lower Cook Inlet. This transect ran from the Barren Islands in the South to the Kenai Peninsula in the North (transect C). Data from 6 stations were collected in August of 1998.



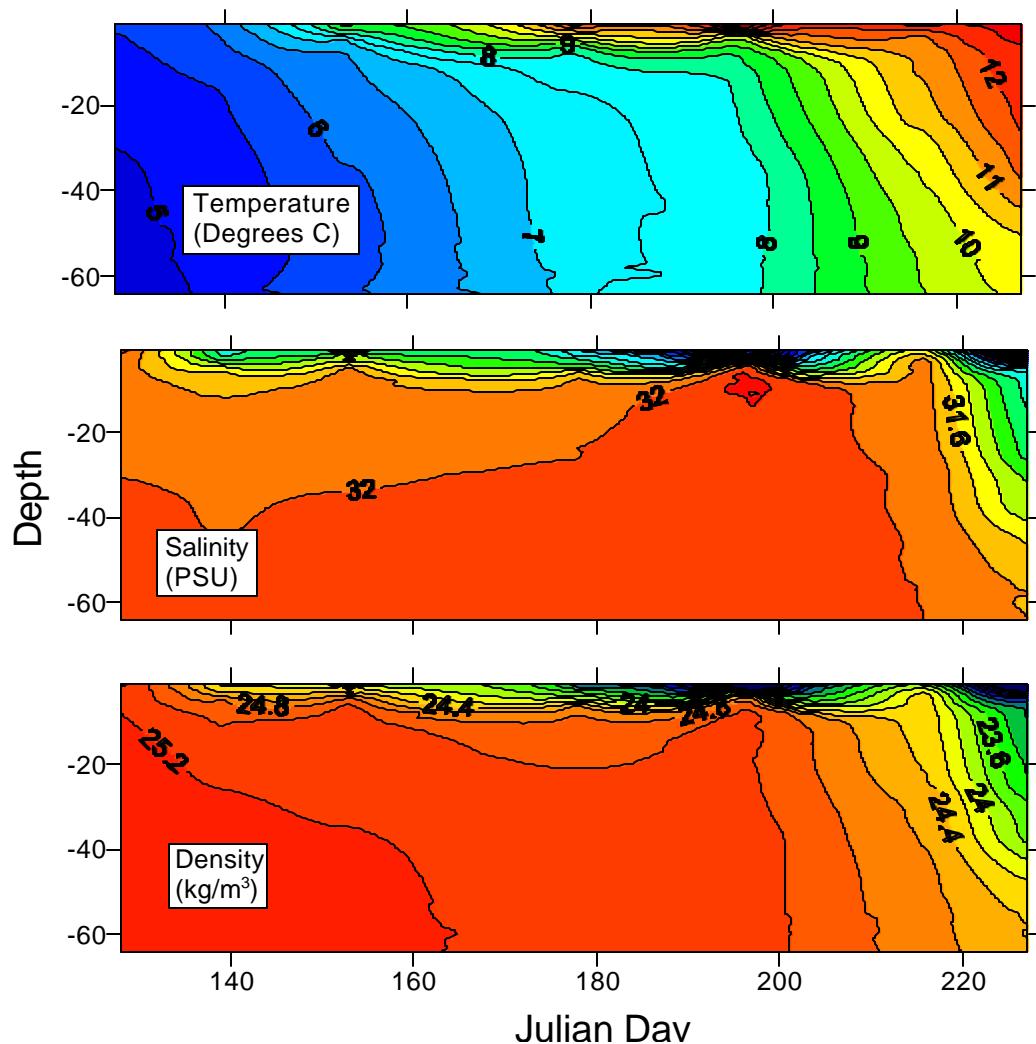
Appendix 2.14. Temperature (A), salinity (B), density (C), turbidity (D), and fluorometry (E) profiles across Kennedy Entrance in lower Cook Inlet. This transect ran from the Barren Islands in the South to the Kenai Peninsula in the North (transect C). Data from 6 stations were collected in August of 1999.



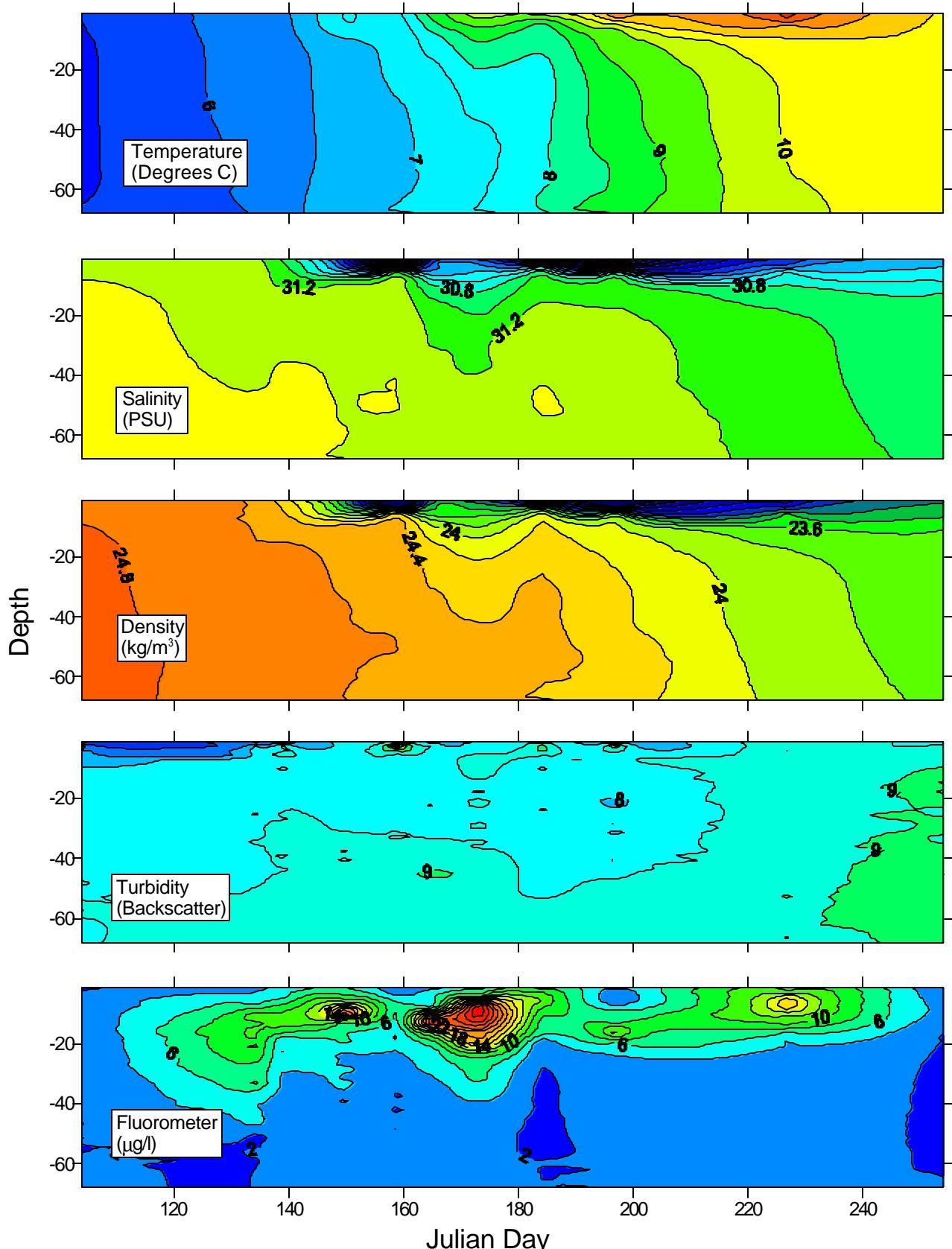
Appendix 2.15. Seasonal temperature, salinity, and density profiles from Station Z in Kachemak Bay. The profile represents the water column through the mid to late-summer months of 1995 (14 samples).



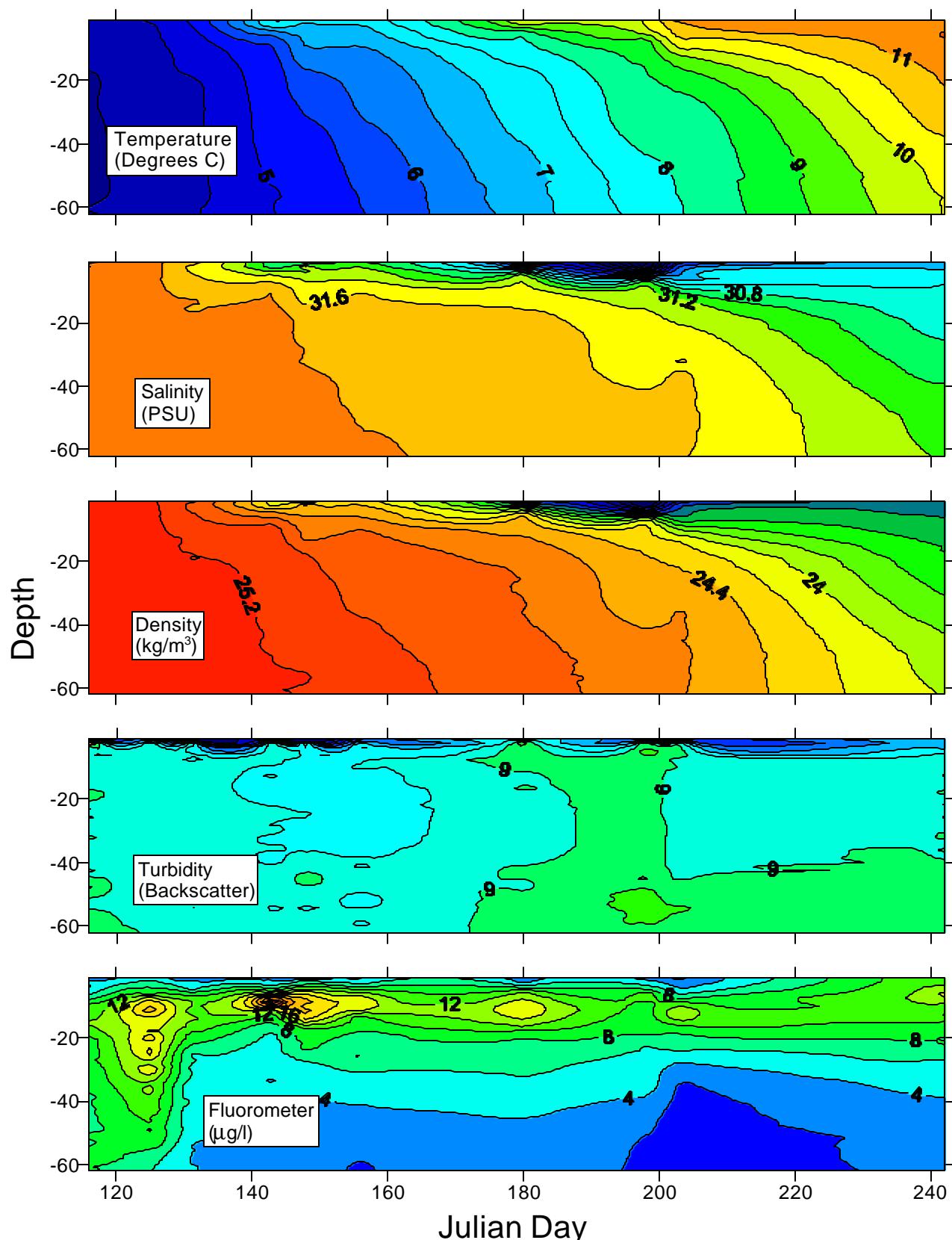
Appendix 2.16. Seasonal temperature, salinity, and density profiles from Station Z in Kachemak Bay.
The profile represents the water column through the mid to late-summer months of 1996 (7 samples).



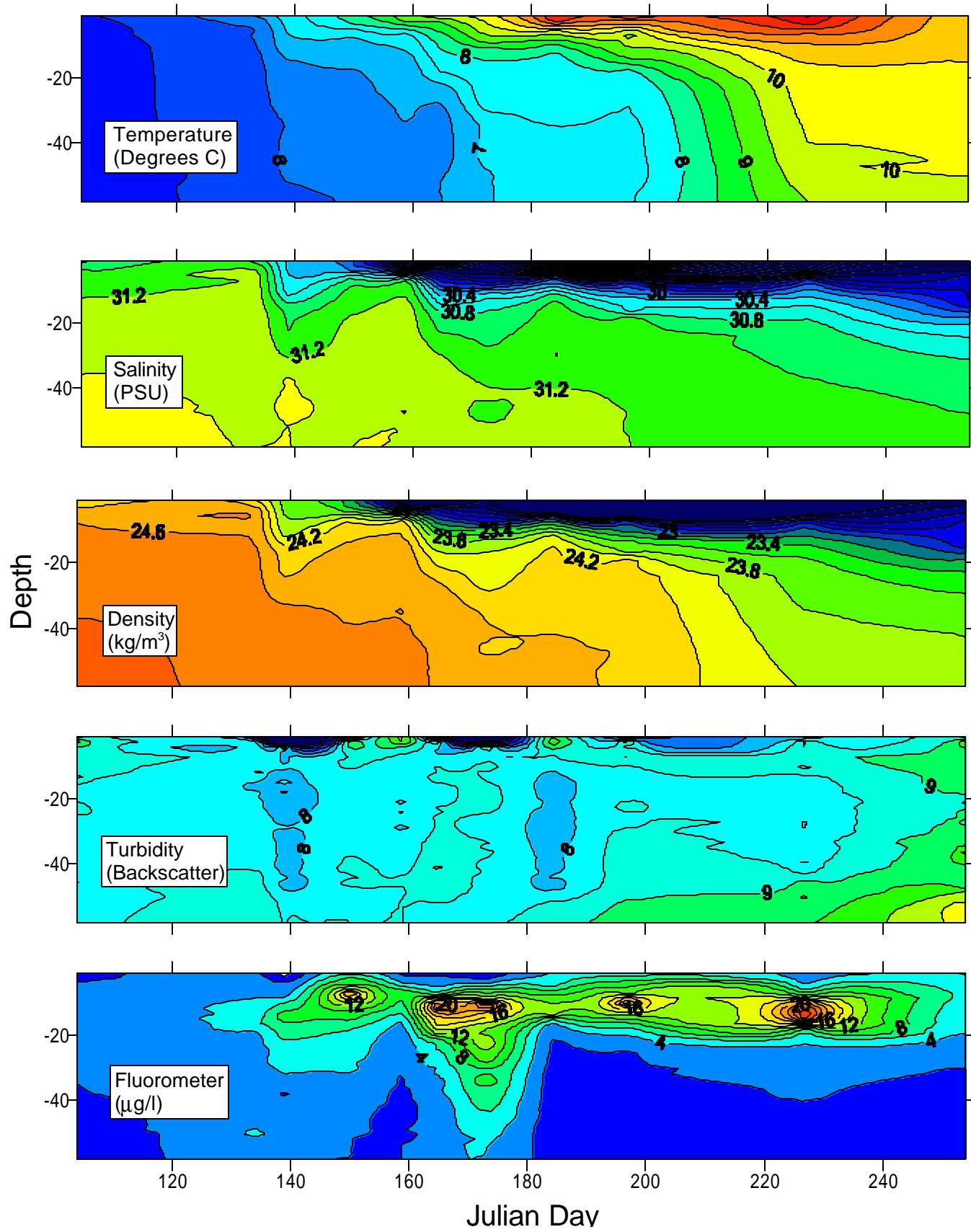
Appendix 2.17. Seasonal temperature, salinity, and density profiles from Eldred Passage in Kachemak Bay. The profile represents the water column through the spring and summer months of 1997 (9 samples).



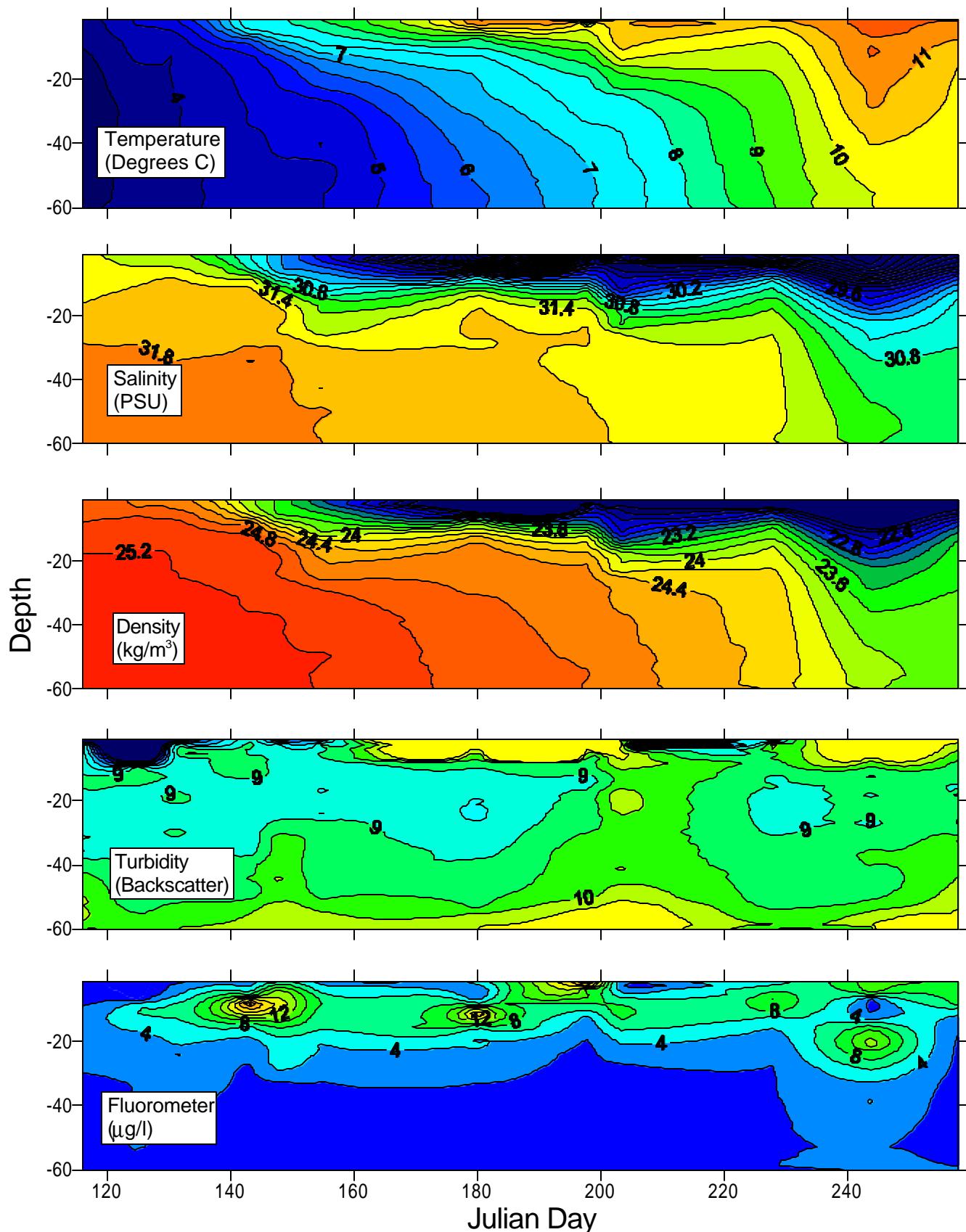
Appendix 2.18. Seasonal temperature, salinity, density, turbidity, and fluorometer profiles from Eldred Passage in Kachemak Bay. The profile represents the water column through the spring and summer months of 1998 (11 samples).



Appendix 2.19. Seasonal temperature, salinity, density, turbidity, and fluorometer profiles from Eldred Passage in Kachemak Bay. The profile represents the water column through the spring and summer months of 1999 (11 samples).



Appendix 2.20. Seasonal temperature, salinity, density, turbidity, and fluorometer profiles from the “Inner Bay” station in Kachemak Bay. The profile represents the water column through the spring and summer months of 1998 (11 samples).



Appendix 2.21. Seasonal temperature, salinity, density, turbidity, and fluorometer profiles from the “Inner Bay” station in Kachemak Bay. The profile represents the water column through the spring and summer months of 1999 (12 samples).

Appendix 2.22. Temperature-logger deployment and recovery information for lower Cook Inlet
1995-1999.

Site	Location	Station Name	Depth (m)	Date In	Date Out	Sample Period (mins)	Records
Kachemak Bay	Gull Island	GULL	3	7/8/95 16:33	9/5/95 21:14	3	26639
Kachemak Bay	Gull Island	GULL	3	2/16/96 17:00	8/15/96 08:10	10	26011
Kachemak Bay	Gull Island	GULL	3	8/15/96 09:45	2/8/97 09:45	60	4249
Kachemak Bay	Gull Island	GULL	3	2/8/97 08:58	5/10/97 11:48	10	13122
Kachemak Bay	Gull Island	GULL	3	5/10/97 12:42	6/25/97 11:42	30	2207
Kachemak Bay	Gull Island	GULL	3	6/25/97 11:58	8/4/97 11:25	30	1916
Kachemak Bay	Gull Island	GULL	3	8/5/97 11:01	8/17/97 11:01	30	577
Kachemak Bay	Gull Island	GULL	3	8/17/97 11:57	10/16/97 07:57	60	1437
Kachemak Bay	Gull Island	GULL	3	10/16/97 09:01	2/28/98 04:01	60	3236
Kachemak Bay	Gull Island	GULL	3	6/10/98 11:00	8/21/98 10:30	30	3456
Kachemak Bay	Gull Island	GULL	3	6/4/99 12:53	6/30/99 11:13	10	3735
Kachemak Bay	Gull Island	GULL	3	6/30/99 11:51	8/14/99 12:11	10	6483
Kachemak Bay	Gull Island	GULL	3	8/14/99 12:36	9/8/99 8:46	10	3578
Kachemak Bay	60Ft. Rock	60FT	3	3/22/96 10:21	8/15/96 9:01	10	21015
Kachemak Bay	60Ft. Rock	60FT	3	3/9/97 10:07	5/9/97 11:57	10	8796
Kachemak Bay	60Ft. Rock	60FT	3	5/9/97 12:45	6/25/97 11:45	10	6763
Kachemak Bay	60Ft. Rock	60FT	3	6/25/97 11:55	8/17/97 07:55	10	7609
Kachemak Bay	60Ft. Rock	60FT	3	5/17/99 10:32	6/2/99 11:32	10	2311
Kachemak Bay	60Ft. Rock	60FT	3	6/2/99 12:19	6/30/99 10:29	10	4022
Kachemak Bay	Hesketh Is.	HES1	10	7/17/97 12:59	5/19/98 14:11	72	6122
Kachemak Bay	Hesketh Is.	HES1	10	8/21/98 21:30	7/14/99 11:45	15	31354
Kachemak Bay	Hesketh Is.	HES1	10	7/14/99 12:53	9/8/99 11:43	10	8058
Kachemak Bay	Hesketh Is.	HES2	80-100	7/17/97 11:46	5/19/98 10:34	72	6120
Kachemak Bay	Hesketh Is.	HES2	80-100	5/20/98 12:43	8/21/98 19:55	24	5599
Kachemak Bay	Hesketh Is.	HES2	80-100	8/21/98 21:23	7/14/99 11:53	15	31355
Kachemak Bay	Hesketh Is.	HES2	80-100	7/14/99 12:45	9/8/99 11:35	10	8058
Kachemak Bay	Harbormouth	HRBR	2	7/8/95 18:08	9/18/95 08:32	3	32446
Kachemak Bay	Harbormouth	HRBR	2	10/10/95 14:39	3/19/96 08:31	16	14468
Seldovia	Raby's Spit	RABY	3	9/15/96 11:07	2/7/97 09:07	12	17451
Chisik Island	Snug Harbor	SNUG	3	7/21/95 18:56	8/31/95 23:00	3	15212
Chisik Island	Snug Harbor	SNUG	3	6/27/96 00:12	8/29/96 21:00	16	5749
Chisik Island	Snug Harbor	SNUG	3	6/14/97 20:31	9/2/97 15:21	10	11489
Chisik Island	Snug Harbor	SNUG	3	5/29/98 13:50	8/26/98 17:00	10	12836
Chisik Island	Snug Harbor	SNUG	3	6/15/99 19:33	9/7/99 15:49	16	7547
Chisik Island	Duck Island	DUCK	3	6/10/98 11:40	8/26/98 17:00	10	11127
Chisik Island	Duck Island	DUCK	3	6/12/99 17:42	9/7/99 13:39	7	19538

Appendix 4.1. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Acoustic filename	Date	Region	Flag	Start time	Tow duration (min:sec)	Flowmeter count
969300101	none	7/16/96	Kachemak	good	11:08:00	14.00	none
969300201	none	7/16/96	Kachemak	good	12:57:00	29.00	none
969300202	none	7/16/96	Kachemak	good	13:58:00	26.00	none
969300301	none	7/16/96	Kachemak	good	15:28:00	25.00	none
969300302	none	7/16/96	Kachemak	good	16:20:00	25.00	none
969300401	none	7/16/96	Kachemak	good	18:41:00	24.00	none
969300501	none	7/17/96	Kachemak	good	8:50:00	28.00	none
969300601	none	7/17/96	Kachemak	good	10:32:00	16.00	none
969300701	none	7/17/96	Kachemak	good	12:36:00	34.00	none
969300801	none	7/17/96	Kachemak	bad	16:10:00	28.00	none
969300901	none	7/17/96	Kachemak	good	17:04:00	25.00	none
969301001	none	7/18/96	Kachemak	good	8:28:00	26.00	none
969301101	none	7/18/96	Kachemak	good	9:50:00	27.00	none
969301201	none	7/18/96	Kachemak	good	16:09:00	29.00	none
969301301	none	7/18/96	Kachemak	good	17:42:00	24.00	none
969301302	none	7/18/96	Kachemak	good	18:38:00	31.00	none
969301401	none	7/18/96	Kachemak	good	20:34:00	46.00	none
969301501	none	7/19/96	Barrens	good	10:56:00	22.00	none
969301601	none	7/19/96	Barrens	good	12:06:00	28.00	none
969301701	none	7/19/96	Barrens	good	13:28:00	27.00	none
969301801	none	7/19/96	Barrens	good	16:37:00	26.00	none
969301901	none	7/19/96	Barrens	good	18:20:00	24.00	none
969302001	none	7/20/96	Barrens	good	8:34:00	20.00	none
969302101	none	7/20/96	Barrens	bad	9:45:00	18.00	none
969302201	none	7/20/96	Barrens	bad	10:27:00	26.00	none
969302301	none	7/20/96	Barrens	good	11:49:00	24.00	none
969302401	none	7/20/96	Barrens	good	13:36:00	19.00	none
969302501	none	7/20/96	Barrens	bad	15:16:00	22.00	none
969302601	none	7/20/96	Barrens	good	16:52:00	28.00	none
969302701	none	7/20/96	Barrens	good	18:54:00	25.00	none
969302801	none	7/21/96	Barrens	good	9:29:00	29.00	none
969302901	none	7/21/96	Barrens	good	11:08:00	28.00	none
969303001	none	7/21/96	Barrens	good	13:12:00	23.00	none
969303101	none	7/21/96	Barrens	bad	18:11:00	25.00	none
969303201	none	7/22/96	Barrens	good	9:08:00	29.00	none
969303301	none	7/22/96	Barrens	good	11:09:00	25.00	none
969303302	none	7/22/96	Barrens	good	12:06:00	17.00	none
969303401	none	7/22/96	Barrens	good	13:36:00	27.00	none
969303501	none	7/22/96	Barrens	good	15:03:00	25.00	none
969303601	none	7/23/96	Barrens	good	7:42:00	17.00	none
969303701	none	7/23/96	lower cook	Q	11:10:00	21.00	none
969303801	none	7/23/96	Chisik	good	16:21:00	13.00	none
969303802	none	7/23/96	Chisik	good	17:03:00	27.00	none
969303901	none	7/23/96	Chisik	good	20:06:00	13.00	none
969304001	none	7/24/96	Chisik	good	15:23:00	25.00	none
969304101	none	7/24/96	Chisik	good	17:03:00	23.00	none
969304201	none	7/25/96	Chisik	good	9:12:00	28.00	none
970200101	cf71925c	7/19/97	Chisik	good	16:45:19	24:32	086708
970200201	cf71925e	7/19/97	Chisik	good	18:12:10	18:27	058299
970200301	cf72004b	7/20/97	Chisik	good	17:49:24	17:11	068170
970200401	cf72103b	7/21/97	Chisik	good	9:23:28	17:15	078183
970200501	cf72103d	7/21/97	Chisik	good	12:04:10	16:06	064816
970200601	cf72121a	7/21/97	Chisik	good	15:15:24	05:28	023279
970200602	cf72121b	7/21/97	Chisik	good	15:35:03	15:53	067720

Appendix 4.1. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Acoustic filename	Date	Region	Flag	Start time	Tow duration (min:sec)	Flowmeter count
970200701	cf72222b	7/22/97	Chisik	good	10:16:39	21:45	084731
970200801	cf72222d	7/22/97	Chisik	good	13:39:39	15:50	060923
970200901	cf72205b	7/22/97	Chisik	good	19:38:06	16:06	054683
970201001	cf72306c	7/23/97	Chisik	good	9:52:21	11:27	046354
970201101	Kf72320b	7/23/97	Kachemak	Q	18:19:34	16:45	062346
970201201	Kf72421b	7/24/97	Kachemak	good	10:08:23	13:01	045535
970201202	Kf72421c	7/24/97	Kachemak	good	10:41:39	21:15	060882
970201301	Kf72423b	7/24/97	Kachemak	good	15:31:56	12:06	006867
970201302	Kf72423c	7/24/97	Kachemak	good	16:03:40	19:26	063940
970201401	Kf72505b	7/25/97	Kachemak	good	10:38:26	18:32	063191
970201501	Kf72505d	7/25/97	Kachemak	good	13:57:04	14:14	057430
970201601	Kf72505e	7/25/97	Kachemak	good	16:13:32	19:40	065595
970201701	Kf72504b	7/25/97	Kachemak	good	17:40:27	16:27	047037
970201801	Kf72624b	7/26/97	Kachemak	good	9:39:03	28:22	077575
970201901	Kf72625b	7/26/97	Kachemak	good	13:35:50	16:48	050558
970202001	Kf72625d	7/26/97	Kachemak	good	14:32:54	19:47	049824
970202101	bf72620b	7/26/97	Barrens	good	18:55:24	23:27	061848
970202201	bf72721c	7/27/97	Barrens	good	9:35:26	12:26	044395
970202301	bf72721d	7/27/97	Barrens	good	10:20:58	27:36	073230
970202401	bf72722b	7/27/97	Barrens	good	15:09:26	27:58	068950
970202501	bf72823b	7/28/97	Barrens	good	10:04:13	29:37	084635
970202502	bf72823c	7/28/97	Barrens	good	10:55:30	13:02	036904
970202601	bf72825b	7/28/97	Barrens	good	15:31:48	09:22	031336
970202701	bf72925e	7/29/97	Barrens	good	9:58:25	11:33	037208
970202801	bf72924b	7/29/97	Barrens	good	13:20:55	32:45	086071
970202901	pf73001b	7/30/97	Barrens	good	9:54:16	14:16	045812
970203001	pf73001d	7/30/97	Barrens	good	11:17:01	06:57	024132
970203101	pf73002b	7/30/97	Barrens	good	12:07:10	19:20	062076
970203201	pf73003b	7/30/97	Barrens	good	15:33:55	13:35	038331
970203301	pf73004b	7/30/97	Barrens	good	17:09:04	10:53	035961
970203401	pf73105b	7/31/97	Barrens	good	9:14:39	11:51	038571
970203501	pf73105d	7/31/97	Barrens	good	10:16:46	10:03	037525
970203601	pf73106b	7/31/97	Barrens	good	11:23:13	12:33	043852
970203701	kf80110a	8/1/97	Kachemak	good	8:59:50	11:03	037987
970203801	kf80101c	8/1/97	Kachemak	good	14:18:10	08:20	032039
970203802	kf80101d	8/1/97	Kachemak	bad	14:47:37	15:23	bad
970203901	kf80102b	8/1/97	Kachemak	good	16:59:12	11:37	034975
970204001	kf80103b	8/1/97	Kachemak	good	18:35:51	11:02	037591
970204101	kf802b	8/2/97	Kachemak	good	12:07:38	19:05	052823
970204201	kf802d	8/2/97	Kachemak	good	14:00:45	26:03	075658
970204202	kf802e	8/2/97	Kachemak	good	14:56:01	22:45	060485
970204203	kf802f	8/2/97	Kachemak	good	15:44:38	12:18	035129
970204301	kf802g	8/2/97	Kachemak	bad	17:35:57	14:57	bad
980100101	KF72123B	7/21/98	Kachemak	bad	14:15:44	13:05	42610
980100102	KF72123C	7/21/98	Kachemak	Q	14:39:25	26:00	83196
980100103	KF72123D	7/21/98	Kachemak	Q	15:42:32	13:30	42374
980100201	KF72224B	7/22/98	Kachemak	bad	16:29:20	12:50	45990
980100301	KF72326B	7/23/98	Kachemak	bad	9:48:44	13:14	49689
980100401	BF72320B	7/23/98	Barrens	good	13:03:00	23:53	69307
980100501	BF72425B	7/24/98	Barrens	bad	9:22:47	11:15	44451
980100601	BF72425D	7/24/98	Barrens	bad	10:54:54	21:22	72151
980100602	none	7/24/98	Barrens	bad	11:50:36	bad	bad
980100603	BF72425E	7/24/98	Barrens	bad	12:08:32	13:26	169491
980100701	PF725Z1	7/25/98	Barrens	bad	16:15:03	11:56	not used

Appendix 4.1. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Acoustic filename	Date	Region	Flag	Start time	Tow duration (min:sec)	Flowmeter count
980100702	PF725Z2	7/25/98	Barrens	bad	16:47:07	14:06	not used
980100801	PF72606B	7/26/98	Barrens	bad	9:25:46	12:40	55242
980100901	PF72606D	7/26/98	Barrens	good	10:32:00	09:10	32761
980100902	PF72606E	7/26/98	Barrens	good	11:07:02	09:06	37033
980101001	PF72605B	7/26/98	Barrens	bad	13:27:56	14:09	45886
980101101	PF726Z3	7/26/98	Barrens	bad	17:08:42	13:31	46149
980101201	PF727Z4	7/27/98	Barrens	good	8:27:34	10:46	39142
980101202	PF727Z5	7/27/98	Barrens	bad	8:58:40	03:40	23619
980101203	PF727Z6	7/27/98	Barrens	good	9:15:48	10:12	38017
980101204	PF727Z7	7/27/98	Barrens	good	10:08:54	12:02	42064
980101301	PF72703B	7/27/98	Barrens	bad	12:14:24	14:16	52255
980101302	PF72703C	7/27/98	Barrens	bad	12:40:38	07:48	29670
980101401	BF72722B	7/27/98	Barrens	Q	16:53:10	28:38	89526
980101402	BF72722C	7/27/98	Barrens	bad	18:03:10	12:04	45008
980101501	BF72722E	7/27/98	Barrens	bad	19:21:38	none	none
980101502	BF72722F	7/27/98	Barrens	Q	20:11:58	11:16	54520
980101601	CF72922B	7/29/98	Chisik	Q	13:38:32	11:18	54084
980101701	CF73021B	7/30/98	Chisik	Q	15:43:10	14:18	50742
980101702	CF73021C	7/30/98	Chisik	Q	none	none	43776
980101801	CF73124B	7/31/98	Chisik	bad	10:02:11	18:36	68886
980101901	CF73124D	7/31/98	Chisik	Q	11:39:42	16:54	62050
980102001	CF73124F	7/31/98	Chisik	bad	13:32:18	00:20	none
980102101	CF73124G	7/31/98	Chisik	bad	13:59:58	06:48	26162
980102102	CF73124H	7/31/98	Chisik	bad	14:24:10	07:26	30363
980102201	CF80105B	8/1/98	Chisik	Q	9:36:50	13:55	50504
980102301	CF80105D	8/1/98	Chisik	bad	11:29:37	10:59	44288
980102401	CF80105F	8/1/98	Chisik	bad	12:40:58	05:01	22476
980102501	KF80323H	8/3/98	Kachemak	good	10:12:24	14:08	45336
980102502	KF80323I	8/3/98	Kachemak	good	10:47:12	11:18	37485
980102601	KF80322B	8/3/98	Kachemak	good	19:20:33	15:04	48811
980102602	KF80322C	8/3/98	Kachemak	bad	19:57:21	-	none
980102701	KF80403B	8/4/98	Kachemak	good	9:41:45	12:00	43450
980102801	KF80420B	8/4/98	Kachemak	good	16:03:47	10:06	35251
980102802	KF80420C	8/4/98	Kachemak	good	16:47:29	11:30	lost
980102901	KF80522E	8/5/98	Kachemak	good	10:35:07	11:01	lost
980102902	KF80522F	8/5/98	Kachemak	good	10:54:47	12:50	lost
980102903	KF80522G	8/5/98	Kachemak	good	11:23:55	09:16	lost
980103001	KF80505B	8/5/98	Kachemak	good	12:30:35	13:41	lost
980103002	KF80505C	8/5/98	Kachemak	good	13:06:39	12:10	lost
980103101	KF80505E	8/5/98	Kachemak	good	15:36:49	10:22	lost
980103201	KF80505G	8/5/98	Kachemak	good	16:18:59	08:56	lost
980103301	KF806Z8	8/6/98	Kachemak	good	11:42:40	12:40	lost
980103401	KF806Z9	8/6/98	Kachemak	good	12:55:50	17:16	lost
980103501	KF806Z10	8/6/98	Kachemak	good	14:17:46	13:24	lost
980103502	KF806Z11	8/6/98	Kachemak	good	14:48:50	12:18	lost
980103601	KF806Z12	8/6/98	Kachemak	bad	17:57:32	08:18	lost
980103602	KF806Z13	8/6/98	Kachemak	bad	18:23:08	10:02	lost
980103701	CF80827C	8/8/98	Chisik	good	12:16:11	13:40	lost
980103702	CF80827D	8/8/98	Chisik	good	12:51:17	15:11	lost
980103801	BF80923B	8/9/98	Barrens	good	17:32:02	26:18	lost
980103901	BF80923E	8/9/98	Barrens	bad	21:20:01	17:10	lost
990200101	kf72524d	7/25/99	Kachemak	Q	13:25:17	31:43	90820
990200201	kf72626b	7/26/99	Kachemak	good	13:34:55	20:57	51332
990200301	bf72620b	7/26/99	Barrens	good	15:55:44	21:27	57922

Appendix 4.1. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Acoustic filename	Date	Region	Flag	Start time	Tow duration (min:sec)	Flowmeter count
990200401	pf72704b	7/27/99	Barrens	good	15:11:15	18:53	53154
990200501	pf72706b	7/27/99	Barrens	good	17:56:05	15:23	45153
990200601	pf72803a	7/28/99	Barrens	good	15:52:16	11:42	37774
990200701	pf72803c	7/28/99	Barrens	good	17:22:08	10:52	32398
990200801	pf72803f	7/28/99	Barrens	good	19:05:32	19:14	57073
990200901	bf72924b	7/29/99	Barrens	good	8:34:16	21:00	65703
990201001	bf72925e	7/29/99	Barrens	bad	11:38:02	17:11	64712
990201101	bf72923b	7/29/99	Barrens	good	17:13:24	20:36	58471
990201201	pf73001b	7/30/99	Barrens	good	13:12:15	20:38	61407
990201301	bf731x1	7/31/99	Barrens	good	9:24:20	20:41	70461
990201401	bf73123e	7/31/99	Barrens	bad	11:59:22	20:34	53266
990201501	bf73121b	7/31/99	Barrens	good	19:07:23	19:07	59786
990201601	cf80226b	8/2/99	Chisik	good	14:06:06	14:34	60932
990201602	cf80226c	8/2/99	Chisik	good	14:38:12	14:18	45855
990201701	cf80226e	8/2/99	Chisik	good	16:40:00	18:12	61392
990201801	cf80325b	8/3/99	Chisik	bad	11:32:02	22:58	79041
990201901	cf80325d	8/3/99	Chisik	Q	13:45:27	19:12	72534
990201902	cf80325e	8/3/99	Chisik	good	14:32:49	16:20	54032
990202001	cf80403b	8/4/99	Chisik	good	9:04:48	15:49	52270
990202101	cf80402b	8/4/99	Chisik	good	10:48:28	16:30	65211
990202201	cf80420b	8/4/99	Chisik	good	15:25:44	14:42	55068
990202301	cf80421b	8/4/99	Chisik	good	17:11:51	15:26	53674
990202401	cf805x2	8/5/99	Chisik	Q	8:30:05	12:15	43088
990202402	cf805x3	8/5/99	Chisik	Q	8:56:53	17:16	57081
990202501	cf80504b	8/5/99	Chisik	good	10:33:00	17:00	58019
990202601	cf80504d	8/5/99	Chisik	good	11:59:44	16:04	55540
990202701	cf80622b	8/6/99	Chisik	bad	11:22:01	17:06	66661
990202702	cf80622c	8/6/99	Chisik	good	11:54:27	21:18	80817
990202801	cf80623b	8/6/99	Chisik	good	14:21:01	17:36	60769
990202901	cf80623d	8/6/99	Chisik	good	16:31:14	18:06	64515
990203001	kf807x4	8/7/99	Kachemak	good	17:14:17	21:12	74930
990203101	kf80801c	8/8/99	Kachemak	good	13:25:37	12:42	46522
990203201	kf80801D	8/8/99	Kachemak	good	14:12:06	08:48	32388
990203301	kf80801F	8/8/99	Kachemak	bad	14:48:48	12:00	40588
990203401	kf80821B	8/8/99	Kachemak	good	17:49:35	12:58	44884
990203501	kf80923b	8/9/99	Kachemak	bad	11:05:31	17:12	57797
990203502	kf80923c	8/9/99	Kachemak	Q	11:34:11	11:36	41961
990203601	kf80923f	8/9/99	Kachemak	good	14:06:48	21:56	71225
990203701	kf81004a	8/10/99	Kachemak	good	8:14:29	13:50	52042
990203801	kf81005b	8/10/99	Kachemak	good	9:47:16	21:30	81821
990203901	kf81005d	8/10/99	Kachemak	good	12:33:46	16:22	62933
990204001	kf81005f	8/10/99	Kachemak	good	14:46:20	16:48	57286
990204101	kf81005h	8/10/99	Kachemak	good	16:27:12	15:06	51197
990204201	kf811x5	8/11/99	Kachemak	bad	8:01:27	08:56	-
990204301	kf811x6	8/11/99	Kachemak	bad	8:28:47	14:58	51010
990204302	kf811x7	8/11/99	Kachemak	Q	9:01:03	15:08	49306
990204401	kf811x8	8/11/99	Kachemak	good	9:46:45	12:36	43106
990204501	kf811x9	8/11/99	Kachemak	bad	10:33:33	16:14	54217

Appendix 4.1. Cont'd. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Start latitude (dec. degrees)	Start longitude (dec. degrees)	End latitude (dec. degrees)	End longitude (dec. degrees)	CTD end of tow (*.hex)	Station depth (m)	Target depth (m)	Distance towed (km)	CPUE #	TDR used
969300101	59.5915	151.4723	59.5927	151.4842	bird00	16	7	0.68	1.47	no
969300201	59.5486	151.4962	59.5343	151.5198	bird01	60	20	2.07	0.48	no
969300202	59.5478	151.4989	59.5334	151.5242	bird01	78	18	2.15	0.47	no
969300301	59.5541	151.5072	59.5425	151.5317	bird02	160	22	1.88	0.53	no
969300302	59.5552	151.4991	59.5415	151.5289	bird02	147	15	2.27	0.44	no
969300401	59.5805	151.3546	-	-	bird03	47	23	x	0.59	no
969300501	59.6029	151.5826	59.5951	151.5518	bird04	21	13	1.94	0.52	no
969300601	59.6427	151.6897	59.6378	151.6725	bird05	12	7	1.11	0.90	no
969300701	59.6620	151.7629	59.6521	151.7306	bird06	20	12	2.12	0.47	no
969300801	59.5869	151.9437	59.5920	151.9083	none	36	24	2.07	0.48	no
969300901	59.5910	151.9336	59.6056	151.9073	bird07	35	13	2.19	0.46	no
969301001	59.5007	151.5546	59.5007	151.5879	bird08	73	11	1.88	0.53	no
969301101	59.4910	151.6030	59.5018	151.6361	bird09	65	19	2.22	0.45	no
969301201	59.4918	151.6535	59.4881	151.6914	bird10	40	15	2.18	0.46	no
969301301	59.5007	151.8055	59.5001	151.7658	bird11	78	24	2.24	0.45	no
969301302	59.5013	151.7679	59.5022	151.8022	bird11	76	23	1.94	0.52	no
969301401	59.4631	152.0468	59.4793	152.0520	bird12	72	23	1.83	0.55	no
969301501	59.2522	152.1745	59.2397	152.1971	bird13	109	30	1.89	0.53	no
969301601	59.2341	152.2664	59.2150	152.2850	bird14	85	23	2.38	0.42	no
969301701	59.1897	152.3117	59.2042	152.2974	bird15	97	11	1.80	0.55	no
969301801	59.0529	152.4167	59.0738	152.4131	bird16	139	13	2.32	0.43	no
969301901	59.0016	152.3712	59.0017	152.4024	bird17	121	75	1.79	0.56	no
969302001	58.9301	152.9963	58.9258	152.0215	bird18	44	19	x	0.48	no
969302101	58.9101	152.0947	58.9022	152.0779	bird19	61	20	1.31	0.76	no
969302201	58.9066	152.0899	58.9160	152.0987	bird19	45	10	1.16	0.86	no
969302301	58.9036	152.2504	58.9089	152.2301	bird20	30	20	1.30	0.77	no
969302401	58.9239	152.1638	58.9380	152.1345	bird21	54	64	2.30	0.44	no
969302501	58.9417	151.9745	58.9555	151.9976	bird22	78	30	2.02	0.49	no
969302601	58.9171	151.8032	58.9203	151.8484	bird23	161	82	2.62	0.38	no
969302701	58.9170	151.5769	58.9153	151.6179	bird24	123	29	2.36	0.42	no
969302801	59.0012	151.9102	58.9997	151.8553	bird200	163	102	3.15	0.32	no
969302901	59.0006	152.0243	58.9985	151.9772	bird201	125	51	2.70	0.37	no
969303001	-	-	-	-	bird202	90	62	1.97	0.51	no
969303101	59.0882	151.6466	59.0944	151.6271	bird203	44	25	1.31	0.77	no
969303201	59.1836	151.8587	59.1759	151.8922	bird204	31	16	2.09	0.48	no
969303301	59.1797	152.2415	59.1591	152.2612	bird205	116	87	2.56	0.39	no
969303302	59.1740	152.2500	59.1615	152.2615	bird205	116	22	1.54	0.65	no
969303401	59.2164	152.3307	59.1963	152.3537	bird206	104	9	2.59	0.39	no
969303501	59.2632	152.2169	59.2476	152.2345	bird207	100	40	2.00	0.50	no
969303601	59.4253	152.0406	59.4394	152.0462	bird208	72	55	1.60	0.62	no
969303701	59.5486	152.6846	59.5316	152.6784	bird209	60	30	1.92	0.52	no
969303801	59.8662	152.3866	59.8465	152.4126	bird210	69	29	2.63	0.38	no
969303802	59.8452	152.4194	59.8633	152.3979	bird210	69	36	2.34	0.43	no
969303901	59.8360	152.8955	59.8391	152.8735	bird211	12	9	1.28	0.78	no
969304001	59.9895	152.1831	60.0030	152.1742	bird212	71	49	1.59	0.63	no
969304101	59.9270	152.2777	59.9054	152.2958	bird213	71	47	2.60	0.38	no
969304201	60.0137	152.4656	60.0012	152.4693	bird214	35	31	1.40	0.71	no
970200101	59.9146	152.1691	59.9111	152.1344	771900	65	25	1.97	0.51	no
970200201	59.9128	152.2242	59.9109	152.2023	771901	83	50	1.24	0.81	no
970200301	60.1057	152.5425	60.1170	152.5353	772002	30	5	1.31	0.76	no
970200401	60.1384	152.5329	60.1410	152.5124	772100	15	5	1.17	0.85	no
970200501	60.2200	152.4464	60.2158	152.4653	772102	10	5	1.14	0.88	no
970200601	60.2485	152.1162	60.2493	152.1037	772103	19	5	0.69	1.45	no
970200602	60.2490	152.1130	60.2566	152.1207	772103	19	5	0.95	1.05	no

Appendix 4.1. Cont'd. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Start latitude (dec. degrees)	Start longitude (dec. degrees)	End latitude (dec. degrees)	End longitude (dec. degrees)	CTD end of tow (*.hex)	Station depth (m)	Target depth (m)	Distance towed (km)	CPUE #	TDR used
970200701	60.1628	152.3112	60.1529	152.2936	772204	52	10	1.47	0.68	no
970200801	60.1683	152.0277	60.1562	152.0483	772205	42	5	1.76	0.57	no
970200901	59.9855	152.5884	59.9681	152.6084	772206	19	10	2.24	0.45	no
970201001	59.8707	152.6309	59.8668	152.6557	772300	23	5	1.45	0.69	no
970201101	59.7496	152.0801	59.7725	152.0620	772308	36	5	2.74	0.36	no
970201201	59.6685	151.8704	59.6626	151.8436	772400	20	5	1.64	0.61	no
970201202	59.6681	151.8675	59.6565	151.8304	772400	20	19	2.45	0.41	no
970201301	59.5843	151.7659	59.5872	151.7449	772401	50	5	1.22	0.82	no
970201302	59.5899	151.7412	59.5846	151.7631	772402	50	5	1.37	0.73	no
970201401	59.6823	151.1889	59.6708	151.2115	772503	50	24	1.80	0.56	no
970201501	59.7004	151.1200	59.7094	151.1068	772504	62	5	1.24	0.81	no
970201601	59.6497	151.2204	59.6384	151.2326	772505	57	47	1.43	0.70	no
970201701	59.6383	151.3947	59.6466	151.3740	772506	14	5	1.48	0.67	no
970201801	59.5006	151.8049	59.5008	151.8451	772607	84	50	2.27	0.44	no
970201901	59.4156	152.1117	59.4140	152.1379	772608	94	5	1.50	0.67	no
970202001	59.4210	152.0863	59.4127	152.1104	772609	92	39	1.64	0.61	no
970202101	59.2524	152.3680	59.2532	152.4002	772610	100	70	1.83	0.55	no
970202201	59.1791	152.0385	59.1729	152.0330	772700	104	10	0.75	1.33	no
970202301	59.1497	151.9963	59.1641	152.0088	772701	124	80	1.75	0.57	no
970202401	59.0873	151.9420	59.0703	151.9320	772702	172	90	1.97	0.51	no
970202501	59.0008	151.6885	59.0019	151.7365	772803	133	90	2.75	0.36	no
970202502	59.0010	151.7082	59.0012	151.7313	772803	130	15	1.32	0.76	no
970202601	58.9393	152.1341	58.9304	152.1277	772804	83	5	1.05	0.95	no
970202701	58.8987	152.3409	58.9059	152.3640	772905	33	10	1.55	0.65	no
970202801	58.9178	151.8144	58.9154	151.8476	772906	161	90	1.92	0.52	no
970202901	59.2008	151.8491	59.2054	151.8710	773000	24	8	1.34	0.74	no
970203001	59.2016	151.7805	59.2052	151.7835	773001	68	5	0.44	2.30	no
970203101	59.1582	151.7629	59.1723	151.7679	773002	60	30	1.59	0.63	no
970203201	59.1430	151.5892	59.1482	151.5693	773003	65	32	1.27	0.78	no
970203301	59.1862	151.5011	59.1848	151.4981	773004	21	8	0.23	4.26	no
970203401	59.1467	151.5380	59.1384	151.5405	773105	30	25	0.94	1.07	no
970203501	59.1034	151.4610	59.1045	151.4750	773106	29	5	0.80	1.24	no
970203601	59.1027	151.6350	59.1127	151.6263	773107	22	8	1.21	0.83	no
970203701	59.4892	151.5873	59.4919	151.6011	780108	30	21	0.83	1.20	no
970203801	59.6625	151.7417	59.6681	151.7548	780109	12	5	0.96	1.04	no
970203802	59.6623	151.7403	59.6697	151.7552	780109	15	8	1.18	0.85	no
970203901	59.6366	151.6858	59.6424	151.6932	780110	25	13	0.78	1.29	no
970204001	59.5966	151.5530	59.5963	151.5395	780111	23	15	0.76	1.32	no
970204101	59.5021	151.6841	59.5028	151.6525	780200	75	55	1.78	0.56	no
970204201	59.4981	151.5539	59.4960	151.5206	780201	123	92	1.90	0.53	no
970204202	59.4985	151.5491	59.4960	151.5228	780202	117	60	1.51	0.66	no
970204203	59.4983	151.5505	59.4972	151.5343	780202	106	5	0.92	1.09	no
970204301	59.5889	151.3361	59.5792	151.3395	780203	64	5	1.10	0.91	no
980100101	59.5846	151.7324	59.5856	151.7514	8072600	52	40	1.07	0.93	yes
980100102	59.6529	151.7543	59.5858	151.7231	8072600	56	40	7.66	0.13	yes
980100103	59.5874	151.7164	59.6048	151.7362	8072600	40	18	2.23	0.45	yes
980100201	59.4994	152.1532	59.4947	152.1627	8072601	45	5	0.75	1.33	yes
980100301	59.3312	152.2208	59.3303	152.2031	8072602	78	9	1.01	0.99	yes
980100401	59.2526	152.0740	59.2553	152.1007	8072603	92	65	1.55	0.65	yes
980100501	58.9044	152.0788	58.8993	152.0804	8072604	40	5	0.58	1.72	yes
980100601	58.9038	152.2485	58.9087	152.2328	8072605	30	20	1.06	0.94	yes
980100602	58.9082	152.2347	-	-	8072605	30	20	x	x	yes
980100603	58.9129	152.2296	58.9033	152.2533	8072605	30	20	1.73	0.58	yes
980100701	59.1395	151.7415	59.1419	151.7313	8072606	28	10	0.64	1.56	no

Appendix 4.1. Cont'd. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Start latitude (dec. degrees)	Start longitude (dec. degrees)	End latitude (dec. degrees)	End longitude (dec. degrees)	CTD end of tow (*.hex)	Station depth (m)	Target depth (m)	Distance towed (km)	CPUE #	TDR used
980100702	59.1456	151.7349	59.1379	151.7221	8072606	28	10	1.13	0.89	no
980100801	59.1356	151.6818	59.1394	151.6859	8072607	40	10	0.48	2.09	yes
980100901	59.1122	151.6266	59.1192	151.6272	8072608	24	10	0.78	1.28	yes
980100902	59.1176	151.6263	59.1103	151.6287	8072608	32	10	0.83	1.21	yes
980101001	59.1345	151.5389	59.1473	151.5423	8072609	28	10	1.44	0.70	yes
980101101	59.1821	151.5813	59.1787	151.5695	none	30	10	0.77	1.29	yes
980101201	59.1790	151.5715	59.1838	151.5822	8080100	34	15	0.81	1.23	yes
980101202	59.1773	151.5501	59.1787	151.5705	8080100	30	10	1.17	0.85	yes
980101203	59.1766	151.5665	59.1818	151.5758	8080100	31	24	0.79	1.26	yes
980101204	59.1784	151.5687	59.1821	151.5814	8080100	12	24	0.83	1.20	yes
980101301	59.1539	151.6728	59.1548	151.6590	8080101	20	5	0.79	1.26	yes
980101302	59.1563	151.6618	59.1569	151.6558	8080101	20	5	0.35	2.87	yes
980101401	59.0856	152.1085	59.1137	152.1267	8080102	177	90	3.29	0.30	yes
980101402	59.0965	152.1116	59.0930	152.1067	8080102	175	90	0.47	2.12	yes
980101501	59.0855	152.2972	59.0789	152.2914	8080103	88	70	0.81	1.24	yes
980101502	59.0841	152.2937	59.0703	152.2893	8080103	92	70	1.56	0.64	yes
980101601	60.1588	152.1861	60.1639	152.1837	8080104	22	5	0.59	1.70	yes
980101701	60.2455	152.4103	60.2326	152.4220	8080105	40	8	1.57	0.64	yes
980101702	60.2330	152.4210	60.2397	152.4195	8080105	38	9	0.75	1.33	yes
980101801	60.0000	152.4494	59.9918	152.4587	8080106	38	12	1.05	0.95	yes
980101901	60.0025	152.2438	59.9894	152.2492	8080107	47	20	1.48	0.68	yes
980102001	59.9970	152.0465	59.9865	152.0501	8080108	40	18	1.19	0.84	yes
980102101	59.9882	152.0593	59.9824	152.0685	8080109	45	5	0.82	1.23	yes
980102102	59.9840	152.0667	59.9868	152.0665	8080109	45	5	0.32	3.15	yes
980102201	60.0265	152.5498	60.0204	152.5600	8080110	38	25	0.89	1.13	yes
980102301	59.9681	152.5962	59.9636	152.5896	8080111	15	5	0.62	1.61	yes
980102401	59.9398	152.6434	59.9399	152.6365	8080112	10	10	0.39	2.59	no
980102501	59.5912	152.1120	59.5899	152.1232	8080700	40	32	0.65	1.54	yes
980102502	59.5905	152.1230	59.5874	152.1263	8080700	37	32	0.40	2.51	yes
980102601	59.6666	151.2214	59.6621	151.2374	8080701	47	25	1.03	0.97	yes
980102602	59.6674	151.2269	-	-	8080701	45	25	x	x	yes
980102701	59.5855	151.4489	59.5908	151.4346	8080702	64	20	1.00	1.00	yes
980102801	59.7483	152.0192	59.7549	152.0183	8080703	28	21	0.73	1.36	yes
980102802	59.7453	152.0189	59.7485	152.0126	8080703	27	21	0.50	2.00	yes
980102901	59.6665	151.1923	59.6626	151.2008	8080704	56	17	0.65	1.54	yes
980102902	59.6649	151.1982	59.6808	151.1851	8080704	60	12	1.92	0.52	yes
980102903	59.6675	151.1903	59.6652	151.2166	8080704	58	9	1.50	0.67	yes
980103001	59.7293	151.0904	59.7246	151.1067	8080705	54	43	1.05	0.95	yes
980103002	59.7285	151.0863	59.7378	151.0841	8080706	54	43	1.04	0.97	yes
980103101	59.6802	151.1598	59.6831	151.1468	8080707	58	20	0.80	1.25	yes
980103201	59.6694	151.1543	59.6735	151.1452	8080708	34	7	0.68	1.46	yes
980103301	59.6739	151.1811	59.6744	151.1976	8080709	58	40	0.92	1.08	yes
980103401	59.6661	151.2066	59.6767	151.1871	8080710	66	44	1.61	0.62	yes
980103501	59.7271	151.0885	59.7365	151.0803	8080711	58	50	1.14	0.87	yes
980103502	59.7361	151.0762	59.7284	151.0865	8080711	40	45	1.03	0.97	yes
980103601	59.4871	151.7025	59.4895	151.6940	8080712	24	10	0.55	1.83	yes
980103602	59.4902	151.6920	59.4865	151.7075	8080712	26	10	0.97	1.03	yes
980103701	59.8303	152.2175	59.8407	152.2065	8081000	58	45	1.30	0.77	yes
980103702	59.8379	152.2114	59.8349	152.2183	8081000	54	46	0.50	1.98	yes
980103801	59.0008	151.9539	59.0089	151.9432	8081007/8	197	110	1.08	0.92	yes
980103901	58.9976	152.3856	58.9954	152.4003	8081010	120	68	0.88	1.14	yes
990200101	59.5005	151.9982	59.4966	151.9701	9072900	60	25	1.64	0.61	yes
990200201	59.3315	152.2750	59.3367	152.2550	9072901	80	60	1.27	0.79	yes
990200301	59.2524	152.2857	59.2530	152.3175	9072902	90	70	1.81	0.55	yes

Appendix 4.1. Cont'd. Station information for all mid-water trawls in Cook Inlet, 1996-1999.

Station key	Start latitude (dec. degrees)	Start longitude (dec. degrees)	End latitude (dec. degrees)	End longitude (dec. degrees)	CTD end of tow (*.hex)	Station depth (m)	Target depth (m)	Distance towed (km)	CPUE #	TDR used
990200401	59.1825	151.4762	59.1837	151.4933	9072909	40	20	0.98	1.02	yes
990200501	59.0985	151.6155	59.1095	151.6133	9072910	40	25	1.23	0.81	yes
990200601	59.1340	151.7392	59.1345	151.7232	9072911	30	20	0.91	1.10	yes
990200701	59.1395	151.6389	59.1397	151.6444	9072912	30	18	0.32	3.16	yes
990200801	59.1554	151.5616	59.1544	151.5735	9072913	38	18	0.69	1.46	yes
990200901	58.9142	151.7378	58.9152	151.7473	9072914	113	90	0.56	1.79	yes
990201001	58.9418	152.1460	58.9432	152.1470	none	50	10	0.17	5.89	yes
990201101	59.0001	151.9978	59.0035	152.0266	90806a00	160	45	1.69	0.59	yes
990201201	59.1919	151.8784	59.1902	151.8677	90806a01	34	20	0.64	1.57	yes
990201301	59.0859	151.9044	59.0914	151.9164	90806a02	100	60	0.92	1.09	yes
990201401	59.0001	151.6224	58.3268	151.6066	90806a03	85	70	x	0.01	yes
990201501	59.1669	152.1054	59.1721	152.1201	90806a04	138	75	1.02	0.98	yes
990201601	59.8308	152.6941	59.8428	152.6861	90806a05	24	8	1.41	0.71	yes
990201602	59.8464	152.6867	59.8393	152.6896	90806a06	26	10	0.81	1.24	yes
990201701	59.8356	152.7522	59.8532	152.7363	90806a07	20	5	2.15	0.47	yes
990201801	59.9098	152.3188	59.9172	152.3118	none	100	65	0.92	1.09	yes
990201901	59.9100	152.0771	59.9154	152.0806	90806a08	40	10	0.63	1.59	yes
990201902	59.9118	152.0789	59.9138	152.0632	90806a09	38	20	0.90	1.11	yes
990202001	60.1921	152.4506	60.1868	152.4502	90806a10	38	10	0.60	1.68	yes
990202101	60.2418	152.4161	60.2276	152.4293	90806a11	25	5	1.74	0.58	yes
990202201	60.3288	152.1243	60.3265	152.1445	90806a12	25	5	1.14	0.88	yes
990202301	60.2491	152.2680	60.2601	152.2648	90806a13	58	5	1.24	0.81	yes
990202401	60.1047	152.5867	60.0992	152.5844	90806a14	50	10	0.62	1.61	yes
990202402	60.1003	152.5853	60.0944	152.5787	90806a14	50	20	0.75	1.34	yes
990202501	60.0961	152.5441	60.0888	152.5459	90806a15	28	10	0.83	1.21	yes
990202601	60.0300	152.5615	60.0379	152.5578	90806a16	20	8	0.90	1.11	yes
990202701	60.1629	152.0372	60.1546	152.0461	90806a17	45	6	1.04	0.96	yes
990202702	60.1635	152.0354	60.1551	152.0439	90806a17	50	20	1.05	0.95	yes
990202801	60.0779	152.0978	60.0736	152.1236	90806a18	60	25	1.51	0.66	yes
990202901	60.0785	152.4216	60.0874	152.4267	90806a19	40	7	1.02	0.98	yes
990203001	59.6829	151.9339	59.6850	151.9499	9080814	28	16	0.93	1.08	yes
990203101	59.6701	151.8740	59.6689	151.8637	9080815	24	7	0.60	1.67	yes
990203201	59.6760	151.8888	59.6735	151.8819	9080816	20	10	0.48	2.07	yes
990203301	59.6800	151.8324	59.6801	151.8522	9080817	15	5	1.12	0.90	yes
990203401	59.6660	152.1773	59.6665	152.1614	9080818	32	6	0.89	1.12	yes
990203501	59.5836	151.9234	59.5834	151.9429	9081100	30	20	1.10	0.91	yes
990203502	59.5841	151.9430	59.5832	151.9278	9081100	30	6	0.86	1.16	yes
990203601	59.5828	151.4021	59.5830	151.4341	9081102	100	75	1.80	0.55	yes
990203701	59.6085	151.4097	59.6154	151.3938	9081103	25	10	1.18	0.85	yes
990203801	59.6456	151.2340	59.6565	151.2628	9081104	40	9	2.02	0.50	yes
990203901	59.6951	151.1620	59.6875	151.1828	9081105	50	16	1.44	0.70	yes
990204001	59.7019	151.1219	59.7128	151.1049	9081106	60	40	1.54	0.65	yes
990204101	59.7020	151.1303	59.7107	151.1174	9081107	70	50	1.21	0.83	yes
990204201	59.5807	151.3522	59.5757	151.3637	none	90	20	0.85	1.18	yes
990204301	59.5803	151.3556	59.5702	151.3665	9081109	90	50	1.27	0.79	yes
990204302	59.5669	151.3674	59.5779	151.3612	9081109	90	50	1.28	0.78	yes
990204401	59.5814	151.2834	59.5854	151.2980	9081110	50	20	0.93	1.07	yes
990204501	59.5834	151.3155	59.5811	151.2894	9081111	60	26	1.49	0.67	yes

Appendix 4.2. Catch-per-mid-water trawl near the Barren Islands, 1996-1999. The number of good trawls is given in parentheses.

Common name	Scientific name	Barrens									
		1996 (19)		1997 (17)		1998 (8)		1999 (11)		1996-1999 (55)	
		mean	stdev	mean	stdev	mean	stdev	mean	stdev	mean	stdev
Pacific sandlance	<i>Ammodytes hexapterus</i>	5.3	14.2	1503.8	3611.2	7108.8	10349.2	3415.3	5154.7	2183.7	5327.9
Pacific herring	<i>Clupea harengus pallasi</i>	0.0	0.0	39.8	78.9	5280.3	10145.1	32.9	71.2	786.9	4104.3
Capelin	<i>Mallotus villosus</i>	17.7	72.5	2.6	10.2	18.5	52.1	147.6	384.5	39.1	180.4
Eulachon	<i>Thaleichthys pacificus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longfin smelt	<i>Spirinchus thaleichthys</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
larval smelt	Osmertidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Walleye pollock	<i>Theragra chalcogramma</i>	458.1	991.0	201.9	425.5	185.4	428.5	28.2	80.1	253.3	657.7
Pacific Cod	<i>Gadus macrocephalus</i>	0.0	0.1	0.2	0.5	0.3	0.9	0.0	0.0	0.1	0.4
Saffron cod	<i>Eleginops gracilis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
saffron or pacific cod	saffron or pacific cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific sandfish	<i>Trichodon trichodon</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prowfish	<i>Zaprora sinenuis</i>	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0
White-spotted greenling	<i>Hexagrammos stelleri</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lingcod	<i>Ophiodon elongatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0
Salmon	<i>Oncorhynchus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silver salmon	<i>Oncorhynchus kisutch</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
King salmon	<i>Oncorhynchus tshawytscha</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red salmon	<i>Oncorhynchus nerka</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	<i>Oncorhynchus gorbuscha</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dolly varden	<i>Salvelinus malma</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poachers	Agonidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tubenose poacher	<i>Pallasina barbata</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Smooth alligatorfish	<i>Anoplagonus inermis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aleutian alligatorfish	<i>Aspidophoroides bartoni</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bathyagonus spp.	<i>Bathyagonus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sturgeon poacher	<i>Podothecus acipenserinus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pricklebacks	Stichaeidae	0.0	0.0	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.3
Snake prickleback	<i>Lumpenus sagitta</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.1	0.1	0.5
Slender eelblenny	<i>Lumpenus fabricii</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lumpenus spp.	<i>Lumpenus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sculpins	Cottidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silverspotted sculpin	<i>Blepsias cirrhosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Armorhead sculpin	<i>Gymnoanthus galeatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crested sculpin	<i>Blepsias bilobus</i>	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Myoxocephalus spp.	<i>Myoxocephalus spp.</i>	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Ribbed sculpin	<i>Triglops pingeli</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slim sculpin	<i>Radulinus asprellus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tadpole sculpin	<i>Psychrolutes paradoxus</i>	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Spinyhead sculpin	<i>Dasycottus setiger</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern sculpin	<i>Icelinus borealis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shaggy sea raven	<i>Hemitripterus villosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lumpsuckers and snailfishes	Cyclopteridae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific spiny lumpsucker	<i>Eumicrotremus orbis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liparis spp.	<i>Liparis spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Larval flatfish	Pleuronectidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.2	0.2
Arrowtooth flounder	<i>Atherestes stomias</i>	0.0	0.0	0.0	0.0	2.5	7.0	1.1	2.5	0.6	2.9
Flathead sole	<i>Hippoglossoides elassodon</i>	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Rock sole	<i>Pleuronectes bilineata</i>	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6
Dover sole	<i>Microstomus pacificus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry Flounder	<i>Platichthys stellatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	<i>Hippoglossus stenolepis</i>	0.0	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.0	0.1
Shortfin eelpout	<i>Lycodes brevipes</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Searcher	<i>Bathymaster signatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wolf-eel	<i>Anarrhichthys ocellatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific lamprey	<i>Lampetra trident</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Threespine stickleback	<i>Gasterosteus aculeatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unidentified roundfish	Unidentified roundfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CPUE	Total CPUE	481.5	994.1	1748.6	3617.9	12595.9	15647.3	3626.8	5083.7	3264.3	7556.9

Appendix 4.3. Catch-per-mid-water trawl in Kachemak Bay, 1996-1999. The number of good trawls is given in parentheses.

Common name	Scientific name	Kachemak							
		1996 (16)		1997 (20)		1998 (18)		1999 (12)	
		mean	stdev	mean	stdev	mean	stdev	mean	stdev
Pacific sandlance	<i>Ammodytes hexapterus</i>	153.3	363.2	149.8	279.8	746.7	891.4	3724.4	6469.2
Pacific herring	<i>Clupea harengus pallasi</i>	0.0	0.0	30.8	125.3	118.7	196.9	85.3	289.3
Capelin	<i>Mallotus villosus</i>	13.7	39.5	4.9	20.7	0.9	3.1	0.9	1.8
Eulachon	<i>Thaleichthys pacificus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Longfin smelt	<i>Spirinchus thaleichthys</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
larval smelt	Osmeridae	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
Walleye pollock	<i>Theragra chalcogramma</i>	14.9	18.3	254.9	647.3	103.0	191.1	41.5	132.6
Pacific Cod	<i>Gadus macrocephalus</i>	9.9	8.3	22.7	67.0	0.0	0.0	0.1	0.3
Saffron cod	<i>Eleginops gracilis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
saffron or pacific cod	saffron or pacific cod	0.0	0.0	0.0	0.0	1.2	1.6	0.0	0.0
Pacific sandfish	<i>Trichodon trichodon</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Prowfish	<i>Zaprora sinenuis</i>	0.3	0.5	0.1	0.4	0.5	1.5	0.1	0.2
White-spotted greenling	<i>Hexagrammos stelleri</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lingcod	<i>Ophiodon elongatus</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Salmon	<i>Oncorhynchus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silver salmon	<i>Oncorhynchus kisutch</i>	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0
King salmon	<i>Oncorhynchus tshawytscha</i>	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.2
Red salmon	<i>Oncorhynchus nerka</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink salmon	<i>Oncorhynchus gorbuscha</i>	13.5	47.8	0.1	0.5	0.0	0.0	0.0	0.0
Dolly varden	<i>Salvelinus malma</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poachers	Agonidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tubenose poacher	<i>Pallasina barbata</i>	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Smooth alligatorfish	<i>Anoplagonus inermis</i>	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Aleutian alligatorfish	<i>Aspidophoroides bartoni</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bathyagonus spp.	<i>Bathyagonus spp.</i>	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Sturgeon poacher	<i>Podothecus acipenserinus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pricklebacks	Stichaeidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Snake prickleback	<i>Lumpenus sagitta</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slender eelblenny	<i>Lumpenus fabricii</i>	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Lumpenus spp.	<i>Lumpenus spp.</i>	0.0	0.0	1.0	3.7	0.0	0.0	30.2	93.3
Sculpins	Cottidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silverspotted sculpin	<i>Blepsias cirrhosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Armorhead sculpin	<i>Gymnoanthus galeatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Crested sculpin	<i>Blepsias bilobus</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.5
Myoxocephalus spp.	<i>Myoxocephalus spp.</i>	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Ribbed sculpin	<i>Triglops pingeli</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Slim sculpin	<i>Radulinus asprellus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tadpole sculpin	<i>Psychrolutes paradoxus</i>	0.5	1.8	0.1	0.3	0.0	0.0	0.0	0.0
Spinyhead sculpin	<i>Dasyctonus setiger</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern sculpin	<i>Icelinus borealis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shaggy sea raven	<i>Hemimycteris villosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lumpsuckers and snailfishes	Cyclopteridae	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pacific spiny lump sucker	<i>Eumicrotremus orbis</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Liparis spp.	<i>Liparis spp.</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Larval flatfish	Pleuronectidae	0.2	0.7	0.0	0.0	0.4	1.3	0.0	0.0
Arrowtooth flounder	<i>Atherestes stomias</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.9
Flathead sole	<i>Hippoglossoides elassodon</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Rock sole	<i>Pleuronectes bilineata</i>	0.1	0.2	0.1	0.3	0.0	0.0	0.0	0.0
Dover sole	<i>Microstomus pacificus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Starry Flounder	<i>Platichthys stellatus</i>	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Pacific halibut	<i>Hippoglossus stenolepis</i>	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.3
Shortfin eelpout	<i>Lycodes brevipes</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Searcher	<i>Bathymaster signatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wolf-eel	<i>Anarrhichthys ocellatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific lamprey	<i>Lampetra trident</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Threespine stickleback	<i>Gasterosteus aculeatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unidentified roundfish	Unidentified roundfish	0.0	0.0	0.0	0.0	0.0	0.0	98.5	281.9
Total CPUE	Total CPUE	206.5	362.8	465.2	720.8	971.6	939.9	3981.6	6383.5

Appendix 4.4. Catch-per-mid-water trawl near Chisik Island, 1996-1999. The number of good trawls is given in parentheses.

Common name	Scientific name	Chisik						
		1996 (6)		1997 (11)		1998 (7)		
		mean	stdev	mean	stdev	mean	stdev	
Pacific sandlance	<i>Ammodytes hexapterus</i>	13.4	25.5	236.3	599.5	231.3	367.9	78.9
Pacific herring	<i>Clupea harengus pallasi</i>	0.1	0.3	3.9	4.7	0.2	0.5	2.0
Capelin	<i>Mallotus villosus</i>	15.8	24.1	0.3	0.6	0.2	0.4	147.3
Eulachon	<i>Thaleichthys pacificus</i>	0.9	1.4	0.0	0.0	0.0	0.0	0.1
Longfin smelt	<i>Spirinchus thaleichthys</i>	0.0	0.0	28.8	56.3	1.6	4.0	3.8
larval smelt	Osmeridae	0.0	0.0	0.0	0.0	0.0	0.0	3.6
Walleye pollock	<i>Theragra chalcogramma</i>	8.6	13.3	11.4	29.6	0.0	0.0	0.7
Pacific Cod	<i>Gadus macrocephalus</i>	0.3	0.7	6.1	8.6	0.0	0.0	0.6
Saffron cod	<i>Eleginops gracilis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
saffron or pacific cod	saffron or pacific cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific sandfish	<i>Trichodon trichodon</i>	7.0	16.9	3.8	5.6	2.1	3.4	2.2
Prowfish	<i>Zaprora sinenus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.1
White-spotted greenling	<i>Hexagrammos stelleri</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Lingcod	<i>Ophiodon elongatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Salmon	<i>Oncorhynchus spp.</i>	0.0	0.0	0.0	0.0	0.4	0.8	0.1
Silver salmon	<i>Oncorhynchus kisutch</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
King salmon	<i>Oncorhynchus tshawytscha</i>	2.5	6.1	1.8	1.9	0.4	0.6	4.9
Red salmon	<i>Oncorhynchus nerka</i>	0.0	0.0	2.5	3.2	0.0	0.0	0.2
Pink salmon	<i>Oncorhynchus gorbuscha</i>	5.7	14.0	6.7	11.7	0.0	0.0	3.1
Dolly varden	<i>Salvelinus malma</i>	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Poachers	Agonidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tubenose poacher	<i>Pallasina barbata</i>	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Smooth alligatorfish	<i>Anoplagonus inermis</i>	0.1	0.3	0.0	0.0	0.0	0.0	0.0
Aleutian alligatorfish	<i>Aspidophoroides bartoni</i>	0.0	0.0	0.1	0.4	0.0	0.0	0.0
Bathyagonus spp.	<i>Bathyagonus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sturgeon poacher	<i>Podothecus acipenserinus</i>	0.0	0.0	0.1	0.2	0.0	0.0	0.1
Picklebacks	Stichaeidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Snake pickleback	<i>Lumpenus sagitta</i>	0.0	0.0	0.3	0.7	0.0	0.0	1.7
Slender eelblenny	<i>Lumpenus fabricii</i>	0.0	0.0	0.7	1.5	0.0	0.0	0.0
Lumpenus spp.	<i>Lumpenus spp.</i>	0.0	0.0	9.3	27.6	0.0	0.0	0.0
Sculpins	Cottidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Silverspotted sculpin	<i>Blepsias cirrhosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Armorhead sculpin	<i>Gymnocanthus galeatus</i>	0.4	0.9	0.0	0.0	0.0	0.0	0.0
Crested sculpin	<i>Blepsias bilobus</i>	0.0	0.0	0.1	0.3	0.0	0.0	0.0
Myoxocephalus spp.	<i>Myoxocephalus spp.</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ribbed sculpin	<i>Triglops pingeli</i>	0.2	0.4	0.0	0.0	0.0	0.0	0.0
Slim sculpin	<i>Radulinus asprellus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tadpole sculpin	<i>Psychrolutes paradoxus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spinyhead sculpin	<i>Dasycottus setiger</i>	0.2	0.4	0.0	0.0	0.0	0.0	0.0
Northern sculpin	<i>Icelinus borealis</i>	0.2	0.4	0.0	0.0	0.0	0.0	0.0
Shaggy sea raven	<i>Hemitripterus villosus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Lumpsuckers and snailfishes	Cyclopteridae	0.3	0.7	0.0	0.0	0.0	0.0	0.0
Pacific spiny lumpsucker	<i>Eumicrotremus orbis</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Liparis spp.	<i>Liparis spp.</i>	0.0	0.0	0.3	0.9	0.0	0.0	0.2
Larval flatfish	Pleuronectidae	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arrowtooth flounder	<i>Atherestes stoma</i>	0.2	0.4	0.1	0.3	0.0	0.0	1.8
Flathead sole	<i>Hippoglossoides elassodon</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rock sole	<i>Pleuronectes bilineata</i>	0.2	0.4	0.0	0.0	0.0	0.0	0.0
Dover sole	<i>Microstomus pacificus</i>	0.1	0.3	0.0	0.0	0.0	0.0	0.0
Starry Flounder	<i>Platichthys stellatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Pacific halibut	<i>Hippoglossus stenolepis</i>	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Shortfin eelpout	<i>Lycodes brevipes</i>	0.0	0.0	0.0	0.0	0.0	0.0	1.2
Searcher	<i>Bathymaster signatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wolf-eel	<i>Anarrhichthys ocellatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pacific lamprey	<i>Lampetra trident</i>	0.1	0.3	0.6	0.7	0.1	0.2	0.6
Threespine stickleback	<i>Gasterosteus aculeatus</i>	0.0	0.0	0.0	0.0	0.2	0.4	0.1
Unidentified roundfish	Unidentified roundfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CPUE	Total CPUE	56.2	43.7	313.6	585.2	236.5	365.6	256.6

Appendix 4.5. Non-fish species captured in mid-water trawls, 1997-1999.

Station Key	Jellyfish weight (g)	Euphasid weight (g)	Shrimp weight (g)	Squid count	Station Key	Jellyfish weight (g)	Euphasid weight (g)	Shrimp weight (g)	Squid count
970200101	11400	0	0	0	970204001	14900	0	0	0
970200201	11100	700	0	0	970204101	7600	0	0	1
970200301	55	0	0	0	970204201	13100	0	0	5
970200401	0	0	37	0	970204202	4200	470	0	1
970200501	0	0	0	0	970204203	15400	0	0	0
970200601	232	6	11	0	970204301	10900	0	0	0
970200602	5200	0	2	0	980100101	3800	0	0	0
970200701	4400	0	0	0	980100102	1000	0	6	3
970200801	223	0	343	0	980100103	2400	0	0	0
970200901	200	0	11	0	980100201	8800	0	0	0
970201001	600	0	0	0	980100301	4800	0	0	0
970201101	3600	0	0	0	980100401	4800	0	0	0
970201201	63	0	0	0	980100501	200	0	0	0
970201202	20	0	0	0	980100601	100	0	0	0
970201301	5100	0	0	0	980100603	3700	0	0	0
970201302	14100	0	0	0	980100701	2500	0	0	0
970201401	5700	0	0	0	980100702	4800	0	0	0
970201501	11600	0	0	0	980100801	4800	0	0	0
970201601	12300	0	0	0	980100901	3400	0	0	0
970201701	29200	0	0	0	980100902	2900	0	0	0
970201801	1600	0	0	0	980101001	200	0	0	0
970201901	1700	0	0	0	980101101	800	0	0	0
970202001	79300	0	0	0	980101201	1400	0	0	0
970202101	11400	0	0	0	980101202	1030	0	0	0
970202201	450	0	0	0	980101203	<1000	0	0	0
970202301	450	0	0	0	980101204	<1000	0	0	0
970202401	2100	0	0	0	980101301	2800	0	0	0
970202501	950	0	0	0	980101302	450	0	0	0
970202502	12100	0	0	8	980101401	1100	1	0	0
970202601	0	0	0	0	980101402	1200	0	<1	6
970202701	23800	0	0	0	980101502	500	0	0	0
970202801	7600	0	0	0	980101601	0	0	0	0
970202901	4600	0	0	0	980101701	0	0	0	0
970203001	9200	0	0	0	980101702	110	0	0	0
970203101	0	0	0	0	980101801	163	0	0	0
970203201	3000	0	0	0	980101901	1800	0	0	0
970203301	3600	0	0	0	980102001	3000	0	0	0
970203401	150	0	0	0	980102101	2800	0	0	0
970203501	370	0	0	0	980102102	600	0	0	0
970203601	700	0	0	0	980102201	2800	0	0	0
970203701	7400	0	0	0	980102301	42	0	0	0
970203801	6900	0	0	0	980102401	0	0	0	0
970203802	0	0	0	0	980102501	2800	0	0	0
970203901	9800	0	0	0	980102502	3200	0	0	0

Appendix 4.5. Non-fish species captured in mid-water trawls, 1997-1999.

Station Key	Jellyfish weight (g)	Euphasid weight (g)	Shrimp weight (g)	Squid count	Station Key	Jellyfish weight (g)	Euphasid weight (g)	Shrimp weight (g)	Squid count
980102601	2070	0	0	0	990202101	650	0	0	0
980102602	79400	0	0	0	990202201	73	39	0	0
980102701	8800	5	0	0	990202301	0	0	0	0
980102801	1900	0	0	0	990202401	345	0	0	0
980102802	2700	0	0	0	990202402	190	0	1500	0
980102901	22540	0	0.9	1	990202501	1100	0	0	0
980102902	13840	0	0	0	990202601	0	0	0	0
980102903	9060	0	0	0	990202701	0	0	0	0
980103001	3600	0	4	1	990202702	2900	0	1	0
980103002	3700	0	59.2	0	990202801	10600	1100	0	0
980103101	5760	0	0	0	990202901	2300	8	0	0
980103201	18860	0	0	0	990203001	3400	0	0	0
980103301	6060	0	0	0	990203101	38300	0	0	0
980103401	7360	0	0	0	990203201	14000	0	0	0
980103501	3880	0	0	0	990203301	21600	0	0	0
980103502	6300	0	0	0	990203401	35100	0	0	0
980103601	4460	0	0	0	990203501	29800	0	0	0
980103602	1780	0	0	0	990203502	26900	0	0	0
980103701	1300	0	0	0	990203601	20400	11500	0	6
980103702	280	0	0	0	990203701	16400	0	71	0
980103801	1550	5	4.4	1	990203801	0	0	0	0
980103901	4080	0	0	0	990203901	0	0	0	0
990200101	7000	0	0	1	990204001	0	0	0	2
990200201	43800	0	0	1	990204101	0	15500	4	3
990200301	39950	0	0	0	990204201	0	0	0	0
990200401	3600	0	0	0	990204301	12400	0	0	2
990200501	101300	0	0	0	990204302	5000	2	0	0
990200601	12900	0	0	0	990204401	39900	0	0	0
990200701	7200	0	0	0	990204501	9500	0	0	0
990200801	25800	0	0	0					
990200901	13600	0	0	0					
990201001	20400	0	0	0					
990201101	16300	0	0	0					
990201201	70100	0	0	0					
990201301	39600	0	0	0					
990201401	0	0	0	0					
990201501	16100	0	0	0					
990201601	1000	0	0	0					
990201602	320	0	0	0					
990201701	700	0	0	0					
990201801	0	0	0	0					
990201901	75950	0	0	0					
990201902	48600	0	0	0					
990202001	495	17	0	0					

Appendix 4.6. Length-weight regressions for seven forage species that comprised at least 5% of species catch composition in one area/year. Data are combined for all years and areas. For all equations, $y = \log(\text{mass of fish weight in g})$ and $x = \log(\text{fork length of fish in mm})$. N = number of measured fish used in the regression.

Species	N	Size range		Regression equation	r^2
		length (mm)	mass (g)		
Pacific sand lance	2006	55-143	0.45-13.9	$\log(\text{mass}) = 3.192(\log(\text{length})) - 5.848$	0.92
Pacific herring	1089	33-255	0.2-205	$\log(\text{mass}) = 3.513(\log(\text{length})) - 6.072$	0.99
Walleye pollock	1173	21-80	0.16-4.2	$\log(\text{mass}) = 3.240(\log(\text{length})) - 5.561$	0.92
Capelin	707	54-133	0.5-21.4	$\log(\text{mass}) = 3.615(\log(\text{length})) - 6.383$	0.92
Pacific cod	378	35-95	0.6-8.3	$\log(\text{mass}) = 3.247(\log(\text{length})) - 5.464$	0.94
Longfin smelt	246	47-138	0.4-20.0	$\log(\text{mass}) = 3.327(\log(\text{length})) - 5.757$	0.96
Pacific sandfish	85	106-185	17.4-74	$\log(\text{mass}) = 2.611(\log(\text{length})) - 4.044$	0.87

Appendix 6.1. Station information for bottom trawls in Kachemak Bay, 1996-1999.

Station	Date	Region	Site	Flag	Tow duration (min)	Depth (m)	Start latitude	Start long.	End latitude	End long.	CPUE	Boat
961100101	08/08/96	Neptune	N1	good	10.0	18	59.5528	151.4007	59.5532	151.4028	3.47	Munsen
961100201	08/08/96	Neptune	N	good	10.0	10	59.5528	151.3732			2.10	Munsen
961100301	08/08/96	Yukon	Y1	good	7.4	14	59.5250	151.4763	59.5265	151.4848	0.87	Munsen
961100401	08/08/96	Yukon	Y	good	7.4	20	59.5250	151.5002	59.5253	151.5030	2.70	Munsen
961100501	08/08/96	Yukon	Y2	good	10.0	9	59.5067	151.4903	59.5063	151.5000	0.81	Munsen
961100601	08/08/96	Yukon	Y3	good	8.2	19	59.4733	151.4858	59.4730	151.4883	3.04	Munsen
961100701	08/09/96	Neptune	N2	bad	10.0	10	59.5558	151.3730	59.5560	151.3695	-	Munsen
961100702	08/09/96	Neptune	N2	bad	5.0	11	59.5575	151.3678	59.5578	151.3598	-	Munsen
961100703	08/09/96	Neptune	N2	good	5.0	9	59.5567	151.3667	59.5583	151.3593	0.98	Munsen
961100801	08/09/96	Moosehead	M3	good	10.0	10	59.5735	151.3240	59.5718	151.3210	1.77	Munsen
961100901	08/09/96	Moosehead	M2	good	10.0	12	59.5733	151.3248	59.5747	151.3235	2.67	Munsen
961101001	08/09/96	Moosehead	M1	good	10.0	17	59.5895	151.2747	59.5873	151.2740	1.82	Munsen
961101101	08/09/96	Halibut cove	H1	bad	8.8	17	59.6033	151.1872	59.6017	151.1852	-	Munsen
961101201	08/09/96	Halibut cove	H2	good	7.7	12	59.6187	151.2002	-	-	1.79	Munsen
971100101	07/03/97	Yukon	Y3	bad	10.0	18	59.4735	151.4853	-	-	-	Munsen
971100102	07/03/97	Yukon	Y3	good	5.0	18	59.4730	151.4860	59.4730	151.4760	0.78	Munsen
971100201	07/03/97	Yukon	Y2	good	5.0	17	59.5075	151.4918	59.5077	151.4900	4.22	Munsen
971100301	07/03/97	Yukon	Y1	bad	2.0	20	59.5205	151.4418	-	-	-	Munsen
971100302	07/03/97	Yukon	Y1	bad	10.0	14	59.5210	151.4408	59.5223	151.4387	2.31	Munsen
971100303	07/03/97	Yukon	Y1	good	5.0	13	59.5208	151.4402	59.5218	151.4392	3.55	Munsen
971100401	07/03/97	Halibut cove	H1	good	5.0	20	59.6028	151.1855	59.6023	151.1847	6.09	Munsen
971100501	07/03/97	Halibut cove	H2	good	5.0	14	59.6188	151.1928	59.6183	151.1912	4.07	Munsen
971100601	07/03/97	Moosehead	M1	good	5.0	16	59.5873	151.2730	59.5865	151.2723	4.43	Munsen
971100701	07/03/97	Moosehead	M2	good	5.0	23	59.5733	151.2878	59.5742	151.2888	4.09	Munsen
971100801	07/03/97	Moosehead	M3	bad	4.0	11	59.5732	151.3233	59.5735	151.3232	11.59	Munsen
971100802	07/03/97	Moosehead	M3	bad	5.0	11	59.5725	151.3232	59.5747	151.3235	1.83	Munsen
971100803	07/03/97	Moosehead	M3	good	5.0	12	59.5738	151.3228	59.5750	151.3228	3.42	Munsen
971100901	07/03/97	Neptune	N2	good	5.0	11	59.5540	151.3727	59.5537	151.3743	4.39	Munsen
971101001	07/03/97	Neptune	N1	bad	5.0	14	59.5535	151.3923	59.5533	151.4002	1.00	Munsen
971101002	07/03/97	Neptune	N1	bad	5.0	16	-	-	-	-	-	Munsen
971101003	07/03/97	Neptune	N1	good	5.0	15	59.5528	151.4027	59.5525	151.4043	4.39	Munsen
971200101	07/14/97	Halibut cove	H1	bad	2.0	14	59.6035	151.1860	-	-	-	Munsen
971200102	07/14/97	Halibut cove	H1	good	5.0	17	59.6035	151.1858	59.6023	151.1852	3.28	Munsen
971200201	07/14/97	Halibut cove	H2	good	5.0	12	59.6188	151.1925	59.6182	151.1912	4.20	Munsen
971200301	07/14/97	Moosehead	M1	bad	4.0	14	59.5852	151.2727	59.5855	151.2730	10.67	Munsen
971200302	07/14/97	Moosehead	M1	bad	-	13	59.5880	151.2723	-	-	-	Munsen
971200303	07/14/97	Moosehead	M1	good	5.0	15	59.5872	151.2727	59.5863	151.2725	4.76	Munsen
971200401	07/14/97	Moosehead	M2	bad	5.0	15	59.5723	151.2883	59.5732	151.2883	4.78	Munsen
971200402	07/14/97	Moosehead	M2	good	4.0	11	59.5727	151.2883	59.5732	151.2883	7.97	Munsen
971200501	07/14/97	Moosehead	M3	bad	4.0	9	59.5737	151.3227	59.5732	151.3238	5.15	Munsen
971200502	07/14/97	Moosehead	M3	good	5.0	9	59.5727	151.3230	59.5718	151.3232	4.76	Munsen
971200601	07/14/97	Neptune	N2	good	5.0	9	59.5563	151.3702	59.5562	151.3720	4.22	Munsen
971200701	07/14/97	Yukon	Y1	good	5.0	15	59.5205	151.4415	59.5213	151.4402	3.71	Munsen
971200801	07/14/97	Yukon	Y2	good	5.0	9	59.5072	151.4887	59.5078	151.4885	5.93	Munsen
971200901	07/14/97	Yukon	Y3	good	5.0	19	59.4735	151.4862	59.4735	151.4843	4.28	Munsen
971300101	08/06/97	Halibut cove	H1	good	5.0	18	59.6035	151.1863	59.6027	151.2500	0.12	Munsen
971300201	08/06/97	Halibut cove	H2	good	5.0	15	59.6190	151.1932	59.6182	151.1918	3.72	Munsen
971300301	08/06/97	Moosehead	M1	good	5.0	16	59.5895	151.2730	59.5887	151.2725	4.58	Munsen
971300401	08/06/97	Moosehead	M2	good	5.0	17	59.5732	151.2882	59.5740	151.2887	4.58	Munsen
971300501	08/06/97	Moosehead	M3	good	5.0	9	59.5725	151.3233	59.5737	151.3228	3.34	Munsen
971300601	08/06/97	Neptune	N2	good	5.0	9	59.5558	151.3753	59.5557	151.3725	2.76	Munsen
971300701	08/06/97	Neptune	N1	good	5.0	15	59.5528	151.4035	59.5528	151.4022	5.90	Munsen
971300801	08/06/97	Yukon	Y1	good	5.0	17	59.5205	151.4413	59.5213	151.4400	3.71	Munsen
971300901	08/06/97	Yukon	Y2	good	5.0	20	59.5075	151.4910	59.5082	151.4903	5.33	Munsen
971301001	08/06/97	Yukon	Y3	good	5.0	21	59.4735	151.4845	59.4735	151.4870	3.14	Munsen
971400501	08/17/97	Seldovia	S1	bad	-	18	59.4682	151.7080	-	-	-	Munsen
971400502	08/17/97	Seldovia	S1	good	5.0	17	59.4673	151.7075	59.4678	151.7067	6.08	Munsen
971400601	08/17/97	Seldovia	S2	good	5.0	25	59.4673	151.7368	59.4680	151.7343	2.78	Munsen
971400701	08/17/97	Seldovia	S3	good	5.0	12	59.4517	151.7257	59.4505	151.7248	3.21	Munsen
981100101	06/30/98	Seldovia	S2	good	5.0	22	59.4687	151.7368	59.4690	151.7427	1.34	David Grey
981100201	06/30/98	Seldovia	S3	good	5.0	10	59.4512	151.7253	59.4547	151.7253	1.14	David Grey
981100301	06/30/98	Seldovia	S4	good	5.0	15	59.4542	151.7572	59.4560	151.7498	0.96	David Grey
981100401	06/30/98	Yukon	Y3	good	5.0	20	59.4773	151.4918	59.4773	151.4855	1.24	David Grey
981100501	07/01/98	Yukon	Y1	bad	5.0	13	-	-	-	-	-	David Grey
981100502	07/01/98	Yukon	Y1	good	4.0	15	59.5245	151.4454	59.5265	151.4436	1.87	David Grey

Appendix 6.1. Cont'd. Station information for bottom trawls in Kachemak Bay, 1996-1999.

Station	Date	Region	Site	Flag	Tow duration (min)	Depth (m)	Start latitude	Start long.	End latitude	End long.	CPUE #	Boat
981100601	07/01/98	Neptune	N1	good	5.0	15	59.5542	151.3992	59.5556	151.4051	1.20	David Grey
981100701	07/01/98	Neptune	N2	good	5.0	7	59.5592	151.3694	59.5612	151.3675	1.79	David Grey
981100801	07/01/98	Moosehead	M3	good	4.1	8	59.5769	151.3288	59.5795	151.3306	1.48	David Grey
981100901	07/01/98	Moosehead	M1	no tow	-	-	-	-	-	-	-	David Grey
981101001	07/02/98	Moosehead	M4	good	5.0	10	59.5798	151.3173	59.5769	151.2932	0.32	David Grey
981101101	07/02/98	Halibut cove	H2	bad	5.0	10	59.6177	151.1970	59.6198	151.2001	-	David Grey
981101102	07/02/98	Halibut cove	H2	good	5.0	10	59.6177	151.1970	-	-	1.49	David Grey
981101201	07/02/98	Moosehead	M2	good	5.0	23	59.5768	151.2929	59.5783	151.2933	2.60	David Grey
981200101	07/17/98	Seldovia	S2	good	5.0	22	59.4670	151.7390	59.4661	151.7453	1.20	David Grey
981200201	07/17/98	Seldovia	S3	good	5.0	12	59.4520	151.7268	59.4540	151.7289	1.78	David Grey
981200301	07/17/98	Seldovia	S4	bad	hung	18	-	-	-	-	-	David Grey
981200302	07/17/98	Seldovia	S4	good	5.0	17	59.4543	151.7534	59.4529	151.7571	1.71	David Grey
981200401	07/17/98	Seldovia	S5	bad	5.0	35	59.4694	151.7879	59.4644	151.7984	-	David Grey
981200402	07/17/98	Seldovia	S5	good	4.0	33	59.4693	151.7869	59.4661	151.7958	0.72	David Grey
981200501	07/17/98	Yukon	Y1	good	4.0	9	59.5263	151.4437	59.5248	151.4448	2.48	David Grey
981200601	07/17/98	Neptune	N1	good	4.0	11	59.5543	151.4002	59.5558	151.4019	2.40	David Grey
981200701	07/17/98	Neptune	N2	good	5.0	9	59.5601	151.3740	-	-	0.70	David Grey
981200801	07/17/98	Yukon	Y3	good	5.0	20	59.4770	151.4920	59.4758	151.4961	1.66	David Grey
981200901	07/18/98	Moosehead	M3	good	5.0	15	59.5803	151.3295	59.5783	151.3303	1.98	David Grey
981201001	07/18/98	Moosehead	M4	good	5.0	10	59.5793	151.3139	59.5800	151.3183	1.71	David Grey
981201101	07/18/98	Moosehead	M2	bad	hung	17	-	-	-	-	-	David Grey
981201102	07/18/98	Moosehead	M2	questi	5.6	20	59.5776	151.2933	59.5773	151.2931	0.70	David Grey
981201201	07/18/98	Halibut cove	H2	good	5.0	9	59.6199	151.2002	59.6187	151.1981	2.43	David Grey
981201301	07/18/98	Halibut cove	H3	good	4.0	30	59.6065	151.1937	59.6087	151.1927	1.74	David Grey
981201401	07/18/98	Neptune	N3	good	5.0	30	59.5618	151.3797	59.5625	151.3756	1.81	David Grey
981300101	08/13/98	Seldovia	S2	bad	hung	21	-	-	-	-	-	David Grey
981300102	08/13/98	Seldovia	S2	good	5.0	22	59.4676	151.7399	59.4648	151.7495	0.71	David Grey
981300201	08/13/98	Seldovia	sS	good	4.0	31	59.4667	151.7837	59.4607	151.7966	0.45	David Grey
981300301	08/13/98	Seldovia	S4	bad	5.0	15	-	-	-	-	-	David Grey
981300302	08/13/98	Seldovia	S4	good	4.0	15	59.4530	151.7521	59.4521	151.7556	1.98	David Grey
981300401	08/13/98	Seldovia	S3	good	5.0	9	59.4505	151.7248	59.4538	151.7272	1.15	David Grey
981300501	08/13/98	Seldovia	S5b	good	4.0	32	59.4758	151.7760	59.4809	151.7706	0.69	David Grey
981300601	08/13/98	Yukon	Y3	good	5.0	22	59.4758	151.4960	59.4776	151.4932	1.75	David Grey
981300701	08/13/98	Yukon	Y1	good	5.0	16	59.5262	151.4443	59.5272	151.4440	3.75	David Grey
981300801	08/13/98	Neptune	N1	good	5.0	14	59.5552	151.4034	59.5546	151.3982	1.48	David Grey
981300901	08/13/98	Neptune	N2	good	5.0	10	59.5590	151.3771	59.5591	151.3726	1.75	David Grey
981301001	08/14/98	Neptune	N3	bad	scrap	32	-	-	-	-	-	David Grey
981301002	08/14/98	Neptune	N3	bad	scrap	29	-	-	-	-	-	David Grey
981301003	08/14/98	Neptune	N3	good	5.0	34	59.5616	151.3862	59.5610	151.3803	1.32	David Grey
981301101	08/14/98	Moosehead	M3	good	5.8	12	59.5781	151.3299	59.5819	151.3296	1.05	David Grey
981301201	08/14/98	Moosehead	M2	bad	bad	21	-	-	-	-	-	David Grey
981301202	08/14/98	Moosehead	M2	bad	5.0	19	-	-	-	-	-	David Grey
981301203	08/14/98	Moosehead	M2	good	5.0	20	59.5755	151.2933	59.5776	151.2929	1.95	David Grey
981301301	08/14/98	Moosehead	M4	bad	5.0	7	-	-	-	-	-	David Grey
981301302	08/14/98	Moosehead	M4	bad	5.0	7	-	-	-	-	-	David Grey
981301303	08/14/98	Moosehead	M4	good	4.0	7	59.5795	151.3102	59.5795	151.3125	3.42	David Grey
981301401	08/14/98	Halibut cove	H2	good	5.0	6	59.6185	151.1963	59.6195	151.1982	2.92	David Grey
981301501	08/14/98	Halibut cove	H3	good	5.0	32	59.6091	151.1931	59.6065	151.1939	1.54	David Grey
991100101	08/17/99	Seldovia	S2	good	5.0	23	59.4683	151.7556	59.4643	151.7500	0.81	David Grey
991100201	08/17/99	Seldovia	S3	good	5.0	11	59.4497	151.7254	59.4532	151.7260	1.13	David Grey
991100301	08/17/99	Seldovia	S4	good	5.0	16	59.4559	151.7502	59.4549	151.7542	1.75	David Grey
991100401	08/17/99	Seldovia	S5b	good	5.0	33	59.4766	151.7747	59.4747	151.7813	1.04	David Grey
991100501	08/17/99	Neptune	N	bad	5.0	12	59.5558	151.3987	59.5542	151.3957	1.79	David Grey
991100601	08/17/99	Neptune	N2	good	5.0	10	59.5595	151.3778	59.5602	151.3735	1.78	David Grey
991100701	08/17/99	Neptune	N1	good	5.0	14	59.5553	151.4044	59.5536	151.3995	1.33	David Grey
991100801	08/17/99	Neptune	N3	good	5.0	33	59.5615	151.3799	59.5628	151.3736	1.16	David Grey
991100901	08/20/99	Halibut cove	H2	good	5.0	6	59.6191	151.1975	59.6172	151.1960	1.94	David Grey
991101001	08/20/99	Halibut cove	H3	good	5.0	33	59.6087	151.1936	59.6058	151.1956	1.30	David Grey
991101101	08/20/99	Moosehead	M3	good	5.0	12	59.5781	151.3306	59.5805	151.3291	1.59	David Grey
991101201	08/20/99	Moosehead	M4	good	5.0	6	59.5800	151.3174	59.5796	151.3138	2.12	David Grey
991101301	08/20/99	Moosehead	M2	good	3.0	21	59.5778	151.2936	59.5757	151.2924	1.81	David Grey
991101401	08/20/99	Yukon	Y1	good	5.0	14	59.5260	151.4442	59.5235	151.4467	1.45	David Grey
991101501	08/20/99	Yukon	Y3	bad	5.0	19	59.4778	151.4916	59.4776	151.4879	2.12	David Grey
991101502	08/20/99	Yukon	Y3	bad	2.0	25	59.4780	151.4909	59.4783	151.4876	2.31	David Grey

Appendix 6.2. All species captured in "good" bottom trawls in Kachemak Bay, 1996-1999. Mean and standard deviation of CPUE are given for each year. All sizes of fishes captured were included in analyses of CPUE. The number of "good" trawls used for this analysis is given in parentheses by year.

Taxonomic classification	Common name	1996 (11)		1997 (32)		1998 (39)		1999 (13)	
		Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Group: Flatfish (Pleuronectidae)									
<i>Pleuronectes bilineata</i>	Rock sole	45.6	69.4	20.2	22.6	20.2	31.4	15.6	16.2
<i>Hippoglossus stenolepis</i>	Pacific halibut	18.6	45.4	3.2	10.7	3.7	7.3	7.9	14.0
<i>Pleuronectes asper</i>	Yellowfin sole	0.9	1.5	1.6	3.3	3.0	5.9	7.5	14.9
<i>Microstomus pacificus</i>	Dover sole	0.3	1.0	0.0	0.0	0.5	1.3	1.4	3.4
<i>Hippoglossoides elassodon</i>	Flathead sole	0.3	1.0	0.6	2.0	3.8	10.3	7.4	13.6
<i>Atherestes stomias</i>	Arrowtooth flounder	0.0	0.0	0.0	0.0	0.0	0.2	2.2	4.6
<i>Pleuronectes vetulus</i>	English sole	0.0	0.0	0.5	2.8	0.1	0.4	0.2	0.5
<i>Errex zachirus</i>	Rex sole	0.0	0.0	0.0	0.0	0.2	0.9	0.1	0.4
<i>Pleuronectes isolepis</i>	Butter sole	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Pleuronectes quadrifasciatus</i>	Alaska plaice	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
<i>Psettidichthys melanostictus</i>	Sand sole	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5
<i>Citharichthys sordidus</i>	Pacific sanddab	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0
Larval Pleuronectidae	Larval flatfish	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0
Group: Cod (Gadidae)									
<i>Gadus macrocephalus</i>	Pacific cod	0.3	1.0	38.8	171.2	0.2	0.8	1.6	2.1
<i>Theragra chalcogramma</i>	Walleye pollock	0.7	1.2	8.7	26.8	0.1	0.4	2.7	8.5
<i>Eleginops gracilis</i>	Saffron cod	0.9	1.8	0.2	0.9	5.0	20.4	0.0	0.0
Saffron or pacific cod	Saffron or pacific cod	0.0	0.0	0.0	0.0	0.9	2.2	0.0	0.0
Group: Sculpin (Cottidae)									
Cottidae	Unidentified sculpins	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
<i>Artedius harringtoni</i>	Scalyhead sculpin	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
<i>Artedius fenestratus</i>	Padded sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7
<i>Dasycottus setiger</i>	Spinyhead sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
<i>Gymnoanthus</i> spp.	Gymnoanthus spp.	0.3	0.9	0.1	0.7	0.1	0.6	0.0	0.0
<i>Gymnoanthus pistilliger</i>	Threaded sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Gymnoanthus galeatus</i>	Armorhead sculpin	0.3	1.0	0.6	2.9	0.2	0.5	0.3	0.7
<i>Myoxocephalus</i> spp.	Myoxocephalus spp.	10.1	14.5	2.7	3.1	0.9	1.8	1.9	3.1
<i>Myoxocephalus polyacanthocephalus</i>	Great sculpin	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
<i>Hemilepidotus hemilepidotus</i>	Red irish lord	0.0	0.0	1.5	4.6	0.7	1.1	1.4	2.9
<i>Hemilepidotus jordani</i>	Yellow irish lord	2.7	6.1	1.4	4.4	0.4	1.2	0.2	0.5
<i>Icelinus borealis</i>	Northern sculpin	1.2	2.6	0.7	2.9	0.9	2.3	1.0	1.7
<i>Radulinus asprellus</i>	Slim sculpin	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0
<i>Rhamphocottus richardsoni</i>	Grunt sculpin	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
<i>Triglops</i> spp.	Triglops spp.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Triglops pingeli</i>	Ribbed sculpin	1.4	2.6	0.2	0.8	1.4	4.5	0.5	1.4
<i>Triglops macellus</i>	Roughspine sculpin	0.3	1.0	3.2	7.9	0.5	2.9	0.9	2.3
<i>Blepsias bilobus</i>	Crested sculpin	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0
<i>Nautichthys oculofasciatus</i>	Sailfin sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Nautichthys pribilovius</i>	Eyeshade sculpin	0.6	1.0	1.5	4.3	0.3	0.9	0.2	0.6
<i>Psychrolutes paradoxus</i>	Tadpole sculpin	0.0	0.0	0.0	0.0	0.2	0.9	0.1	0.3
<i>Enophrys bison</i>	Buffalo sculpin	0.0	0.0	0.2	0.8	0.1	0.5	0.2	0.6
<i>Enophrys lucasi</i>	Leister sculpin	0.0	0.0	0.0	0.0	0.2	0.8	0.0	0.0
<i>Blepsias cirrhosus</i>	Silverspotted sculpin	3.2	5.4	0.8	1.8	0.3	0.8	2.4	5.3
<i>Clinocottus acuticeps</i>	Sharpnose sculpin	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3
<i>Microcottus sellaris</i>	Brightbelly sculpin	0.0	0.0	0.3	1.4	0.0	0.0	0.0	0.0
<i>Oligocottus maculosus</i>	Tidepool sculpin	0.0	0.0	0.0	0.0	0.1	0.8	0.0	0.0
<i>Asemichthys taylori</i>	Spinynose sculpin	0.0	0.0	0.0	0.0	0.1	0.4	0.0	0.0

Appendix 6.2. Cont'd. All species captured in "good" bottom trawls in Kachemak Bay, 1996-1999. Mean and standard deviation of CPUE are given for each year. All sizes of fishes captured are included in this table. The number of "good" trawls used for this analysis is given in parentheses by year.

Taxonomic classification	Common name	1996 (11)		1997 (32)		1998 (39)		1999 (13)	
		Mean	Stdev	Mean	Stdev	Mean	Stdev	Mean	Stdev
Group: Prickleback (Stichaeidae)									
<i>Lumpenus sagitta</i>	Snake prickleback	0.0	0.0	0.1	0.8	1.7	6.8	1.0	3.0
<i>Lumpenus maculatus</i>	Daubed shanny	0.7	2.2	0.0	0.0	0.0	0.0	0.0	0.0
<i>Lumpenus fabricii</i>	Slender eelblenny	1.3	4.2	0.0	0.0	0.1	0.5	11.2	27.3
<i>Sitchaeus punctatus</i>	Arctic shanny	1.5	3.7	3.4	8.0	1.1	2.1	1.4	4.4
<i>Chiroplophis snyderi</i>	Wendell's warbonnet	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0
Group: Ronquil (Bathymasteridae)									
<i>Ronquilus jordani</i>	Northern ronquil	5.0	8.3	4.2	7.9	1.3	2.0	2.8	3.7
<i>Bathymaster signatus</i>	Searcher	0.6	1.8	0.3	1.2	0.3	1.1	2.6	4.6
Group: Greenling (Hexagrammidae)									
<i>Hexagrammos</i> spp.	Hexagrammos spp.	1.6	4.8	0.3	1.5	0.0	0.0	0.0	0.0
<i>Hexagrammos decagrammus</i>	Kelp greenling	0.0	0.0	0.6	1.6	0.0	0.0	0.0	0.0
<i>Hexagrammos lagocephalus</i>	Rock greenling	3.3	6.8	0.4	1.4	0.6	1.4	1.4	3.0
<i>Hexagrammos octogrammus</i>	Masked greenling	0.0	0.0	0.9	2.2	1.6	6.0	0.0	0.0
<i>Hexagrammos stelleri</i>	White-spotted greenling	0.7	1.4	0.6	1.9	0.9	1.5	3.3	10.0
<i>Ophiodon elongatus</i>	Lingcod	0.0	0.0	0.1	0.6	0.3	1.0	1.1	2.4
<i>Oxylebius pictus</i>	Painted greenling	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
Group: Rockfish (Sebastes spp.)									
<i>Sebastes</i> spp.	Rockfish	0.3	0.7	3.1	9.7	1.1	2.8	0.0	0.0
<i>Sebastes aleutianus</i>	Rougheye rockfish	0.0	0.0	0.0	0.0	0.0	0.0	9.4	32.6
<i>Sebastes reedi</i>	Yellowmouth rockfish	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0
Group: Poachers (Agonidae)									
<i>Podothecus acipenserinus</i>	Sturgeon poacher	0.1	0.3	0.2	1.1	0.0	0.3	0.1	0.5
<i>Pallasina barbata</i>	Tubenose poacher	0.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0
<i>Hypsagonus quadricornis</i>	Fourhorn poacher	0.0	0.0	0.3	1.0	0.0	0.1	0.0	0.0
<i>Sarritor frenatus</i>	Sawback poacher	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
<i>Bathyagonus infraspinata</i>	Spinycheek starsnout	0.4	1.3	0.0	0.0	0.3	1.1	0.3	1.1
<i>Anoplagonus inermis</i>	Smooth alligatorfish	0.3	1.1	0.2	0.9	0.1	0.4	0.1	0.4
<i>Aspidophoroides bartoni</i>	Aleutian alligatorfish	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.0
Group: Snailfish									
<i>Eumicrotremus orbis</i>	Pacific spiny lumpucker	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2
<i>Liparis</i> spp.	Snailfish	1.5	2.0	0.5	1.7	0.2	0.7	1.0	1.7
Group: Gunnel (Pholidae)									
<i>Pholidae</i> (Pholididae)	Gunnels	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0
<i>Pholis laeta</i>	Crescent gunnel	1.4	1.9	0.6	1.6	0.5	1.6	0.5	1.1
<i>Pholis ornata</i>	Saddleback gunnel	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Group: Other									
<i>Ammodytes hexapterus</i>	Pacific sand lance	0.0	0.0	0.1	0.6	0.0	0.0	0.2	0.6
<i>Bathyraja parmifera</i>	Alaska skate	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
<i>Oncorhynchus</i> spp.	Salmon	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0

Appendix 6.3. SCUBA station information in Kachemak Bay, 1997-1999. Areas include Seldovia (SE), Moosehead (MH), and Cohen. Divers were Jared Figurski (JF), Mayumi Arimitsu (YA), Kim Trust (KT), and Alisa Abookire (AA). Sediment type from the middle of the transect is listed, for more sediment details see database.

Site	Area	Date	Divers	Good/Bad	Depth (m)	Transect length (m)	Total time (min)	Heading	Latitude	Longitude	Mid-transect sediment	% kelp cover
Seldovia 1	SE	08/19/97	JF	Good	6.0	30	-	to shore	59.4533	151.7180	Rock	98%
Seldovia 2	SE	08/19/97	JF	Good	2.7	30	-	to shore	59.4483	151.7192	Rock	100%
Seldovia 3	SE	08/25/97	JF	Good	2.3	30	-	to shore	59.4133	151.6958	Silt	2%
Seldovia 4	SE	08/25/97	JF	Good	4.0	30	-	to shore	59.4067	151.6730	Cobble	0%
Seldovia 5	SE	08/25/97	JF	Good	3.0	30	-	to shore	59.4183	151.7100	Cobble	70%
Seldovia 6	SE	08/25/97	JF	Good	4.0	30	-	to shore	59.4292	151.7408	Cobble	90%
Seldovia 7	SE	08/25/97	JF	Good	-	30	-	to shore	59.4317	151.7167	Silt	100%
Seldovia 8	SE	08/25/97	JF	Good	3.7	30	-	to shore	59.4433	151.7192	Fine sand	20%
Seldovia 9	SE	08/25/97	JF	Good	4.7	30	-	to shore	59.4453	151.7283	Pebbles	70%
Seldovia10	SE	08/25/97	JF	Good	2.7	30	-	to shore	59.4600	151.7067	Sand	30%
Moose 1	MH	08/26/97	JF	Good	4.7	30	-	to shore	59.5697	151.2783	Rock	<10%
Moose 2	MH	08/26/97	JF	Good	11.7	30	-	to shore	59.5742	151.2883	Silt	<10%
Moose 3	MH	08/26/97	JF	Good	4.0	30	-	to shore	59.5767	151.3000	Gravel	10%
Moose 4	MH	08/26/97	JF	Good	6.0	30	-	to shore	59.5753	151.3142	Gravel	<10%
Moose 5	MH	08/26/97	JF	Good	4.3	30	-	to shore	59.5747	151.3197	Gravel	30%
Moose 6	MH	08/26/97	JF	Good	5.0	30	-	to shore	59.5608	151.2800	Cobble	40%
Moose 7	MH	08/26/97	JF	Good	3.7	30	-	to shore	59.5633	151.2950	Sand	40%
Moose 8	MH	08/26/97	JF	Good	1.0	30	-	to shore	59.5683	151.3150	Gravel	0%
Moose 9	MH	08/26/97	JF	Good	4.0	30	-	to shore	59.5833	151.3400	Cobble	<10%
Moose 10	MH	08/26/97	JF	Good	4.7	30	-	to shore	59.5817	151.3517	Fine sand	-
M1	MH	06/27/98	YA,JF	Good	9.5	30	7	0	59.5955	151.2778	Cobble	5%
M2	MH	06/27/98	YA,JF	Good	8.8	30	15	0	59.5917	151.2777	Boulder	50%
M3	MH	06/27/98	AA,KT	Good	4.3	30	46	60	59.5763	151.2710	Mud	80%
M4	MH	06/27/98	AA,KT	Good	6.0	30	8	170	59.5688	151.2760	Gravel	0%
M5	MH	06/27/98	YA,JF	Good	6.0	30	18	110	59.5695	151.2658	Silt	50%
M8	MH	06/27/98	AA,KT	Good	8.0	30	13	70	59.5772	151.3200	Pebbles	15%
M9	MH	06/27/98	AA,KT	Good	6.3	30	13	90	59.5747	151.3125	Mud	20%
M10	MH	06/27/98	AA,KT	Good	5.7	30	7	60	59.5665	151.2985	Pebbles	40%
M12	MH	06/27/98	YA,JF	Good	9.5	30	21	to shore	59.5715	151.3372	-	5%
S1	SE	06/28/98	YA,JF	Good	7.8	30	16	20	59.4535	151.7207	Sand	90%
S6	SE	06/30/98	YA,JF	Good	4.2	30	16	240	59.4252	151.7358	Silt	100%
S11	SE	06/30/98	YA,JF	Good	12.2	30	16	90	59.4485	151.7938	Sand	20%
S12	SE	06/30/98	YA,JF	Good	12.5	30	14	40	59.4543	151.7470	Gravel	10%
S13	SE	06/28/98	YA,JF	Good	7.7	30	17	270	59.4307	151.7388	Silt	75%
S14	SE	06/30/98	YA,JF	Good	3.3	30	16	240	59.4373	151.7348	Silt	80%
S15	SE	06/30/98	YA,JF	Good	13.0	30	16	210	59.4228	151.7325	Silt	40%
S16	SE	06/28/98	YA,JF	Good	7.8	30	16	110	59.4753	151.6920	Boulder	50%
S17	SE	06/28/98	YA,JF	Good	6.3	30	19	150	59.4765	151.6770	-	80%
M1	MH	07/14/98	YA,JF	Good	11.3	60	16	0	59.5955	151.2778	Gravel	5%
M2	MH	07/14/98	YA,JF	Good	10.0	60	16	0	59.5917	151.2777	Boulder	50%
M3	MH	07/14/98	AA,KT	Good	14.3	30	10	60	59.5763	151.2710	Silt	80%
M4	MH	07/14/98	AA,KT	Good	6.7	30	15	170	59.5688	151.2760	Rock	80%
M5	MH	07/14/98	YA,JF	Good	3.3	60	15	110	59.5695	151.2658	-	90%
M6	MH	07/14/98	YA,JF	Good	6.3	60	-	70	59.5763	151.2875	-	40%
M14	MH	07/14/98	YA,JF	Good	7.2	60	-	to shore	59.5705	151.3415	Cobble	2%
S1	SE	07/15/98	AA,KT	Good	8.3	30	-	20	59.4535	151.7207	Sand	100%
S6	SE	07/15/98	AA,KT	Good	8.5	30	-	240	59.4252	151.7358	Sand	100%
S11	SE	07/15/98	YA,JF	Good	12.7	60	10	90	59.4485	151.7938	-	15%
S12	SE	07/15/98	YA,JF	Good	14.3	60	10	40	59.4543	151.7470	Gravel	5%
S13	SE	07/15/98	AA,KT	Good	8.7	30	-	270	59.4307	151.7388	Rock	70%
S14	SE	07/15/98	AA,KT	Good	3.2	30	-	240	59.4373	151.7348	-	90%
S15	SE	07/15/98	YA,JF	Good	6.7	60	-	210	59.4228	151.7325	-	60%
S16	SE	07/15/98	AA,KT	Good	9.3	30	-	110	59.4753	151.6920	Rock	90%
S17	SE	07/15/98	YA,JF	Good	5.8	60	17	150	59.4765	151.6770	Boulder	95%

Appendix 6.3. Cont'd. SCUBA station information in Kachemak Bay, 1997-1999. Areas include Seldovia (SE), Moosehead (MH), and Cohen. Divers were Jared Figurski (JF), Mayumi Arimitsu (YA), Kim Trust (KT), and Alisa Abookire (AA). Sediment type from the middle of the transect is listed, for more sediment details see database.

Site	Area	Date	Divers	Good/Bad	Depth (m)	Transect length (m)	Total time (min)	Heading	Latitude	Longitude	Mid-transect sediment	% kelp cover
S18	SE	07/15/98	YA,JF	Good	7.3	60	11	100	59.4557	151.7158	-	0%
M1	MH	08/18/98	YA,JF	Good	13.7	60	8	0	59.5955	151.2778	Silt	1%
M2	MH	08/18/98	YA,JF	Good	9.5	55	13	0	59.5917	151.2777	Boulder	80%
M3	MH	08/18/98	AA,KT	Good	13.2	30	11	60	59.5763	151.2710	Silt	0%
M4	MH	08/18/98	AA,KT	Good	5.0	30	12	170	59.5688	151.2760	Silt	60%
M5	MH	08/18/98	YA,JF	Good	3.8	60	8	110	59.5695	151.2658	-	90%
M6	MH	08/18/98	YA,JF	Good	7.0	60	22	70	59.5763	151.2875	-	40%
M9	MH	08/18/98	AA,KT	Good	5.7	30	20	90	59.5747	151.3125	Rock	20%
M10	MH	08/18/98	AA,KT	Good	4.5	30	12	60	59.5665	151.2985	Rock	40%
M14	MH	08/18/98	YA,JF	Good	7.2	30	13	to shore	59.5705	151.3415	Fine sand	0%
S1	SE	08/19/98	AA,KT	Good	13.7	30	16		59.4535	151.7207	Rock	90
S6	SE	08/19/98	AA,KT	Good	7.7	30	18	240	59.4252	151.7358	Silt	70%
S11	SE	08/19/98	YA,JF	Good	14.0	60	15	90	59.4485	151.7938	Gravel	15%
S12	SE	08/19/98	YA,JF	Good	15.0	60	8	40	59.4543	151.7470	Gravel	10%
S13	SE	08/19/98	AA,KT	Good	14.3	30	17	270	59.4307	151.7388	Silt	20%
S14	SE	08/19/98	AA,KT	Good	6.2	30	17	300	59.4373	151.7348	Sand	70%
S15	SE	08/19/98	YA,JF	Good	10.0	60	20	210	59.4228	151.7325	Silt	50%
S16	SE	08/19/98	AA,KT	Bad	10.7	30	15	110	59.4753	151.6920	Cobble	90%
S16	SE	08/19/98	YA,JF	Good	8.5	60	13	110	59.4753	151.6920	Rock-reef	80%
Cohen-1	Cohen	07/18/99	AA, YA	Good	5.8	60	23	0	59.5533	151.4692	Rock	30%
Cohen-2	Cohen	07/20/99	AA, YA	Good	6.1	60	13	0	59.5533	151.4692	Cobble	10%
Cohen-3	Cohen	07/22/99	AA, YA	Good	6.4	60	11	0	59.5533	151.4692	Cobble	20%
Seldovia-1	SE	07/18/99	AA, YA	Bad	6.5	100	30	330-240	59.4242	151.7350	Silt	80%
Seldovia-2	SE	07/19/99	AA, YA	Bad	8.0	100	29	240-300	59.4242	151.7350	Silt	40-100%
Seldovia-3	SE	07/20/99	AA, YA	Good	10.5	100	32	330	59.4242	151.7350	Silt	30%
Seldovia-4	SE	07/22/99	AA, YA	Good	10.9	100	22	330	59.4242	151.7350	Silt	30%

Appendix 6.4. All fishes and hermit crabs recorded on "good" SCUBA dives in Kachemak Bay, 1997-1998. Mean CPUE and standard deviation are listed for each year. All sizes of fishes are included in estimates of CPUE. The number of dives is in parentheses by year. An 'a' signifies the mean fish CPUE value was less than 0.04.

Genus species	Common name	1997 (20)		1998 (52)	
		Mean	Stdev	Mean	Stdev
Group: Flatfish (Pleuronectidae)					
Pleuronectidae	Flatfish	0.3	0.9	1.2	3.7
<i>Pleuronectes bilineata</i>	Rock sole	0.3	0.7	0.4	0.8
<i>Psettidichthys melanostictus</i>	Sand sole	0.0	0.0	a	0.1
<i>Platichthys stellatus</i>	Starry flounder	0.0	0.0	a	0.1
Group: Cod (Gadidae)					
Gadidae	Unidentified cod	3.3	5.2	0.1	0.5
<i>Theragra chalcogramma</i>	Walleye pollock	0.1	0.2	0.0	0.0
Group: Sculpin (Cottidae)					
Cottidae	Sculpin	0.2	0.4	2.5	6.6
<i>Artedius</i> spp.	Artedius spp.	0.0	0.0	a	0.1
<i>Blepsias bilobus</i>	Crested Sculpin	0.0	0.0	a	0.1
<i>Enophrys</i> spp.	Enophrys spp.	0.1	0.2	0.0	0.0
<i>Nautichthys pribilovius</i>	Eyeshade sculpin	0.0	0.0	a	0.1
<i>Gymnocanthus</i> spp.	Gymnocanthus	0.0	0.0	1.8	9.2
<i>Hemilepidotus</i> spp.	Irish lords	0.0	0.0	0.1	0.3
<i>Myoxocephalus</i> spp.	Myoxocephalus spp.	1.2	3.2	0.1	0.3
<i>Oligocottus maculosus</i>	tidepool sculpin	0.0	0.0	a	0.1
<i>Hemilepidotus hemilepidotus</i>	Red irish lord	0.0	0.0	0.1	0.5
<i>Blepsias cirrhosus</i>	Silverspotted sculpin	0.2	0.4	0.1	0.6
<i>Triglops</i> spp.	Triglops spp.	0.0	0.0	0.1	0.6
Group: Prickleback (Stichaeidae)					
Stichaeidae	Pricklebacks	0.0	0.0	a	0.1
<i>Anoplarchus purpurescens</i>	High cockscomb	0.1	0.2	a	0.2
<i>Sitcheus punctatus</i>	Arctic Shanny	0.4	1.1	0.3	1.1
<i>Chirolipophis snyderi</i>	Wendell's warbonnet	0.0	0.0	a	0.2
<i>Lumpenus</i> spp.	Lumpenus spp.	0.1	0.2	a	0.1
<i>Lumpenus fabricii</i>	Slender eelblenny	2.2	9.8	0.1	0.4
<i>Lumpenus sagitta</i>	Snake prickleback	0.0	0.0	1.7	8.7
Group: Ronquil (Bathymasteridae)					
Ronquil/Searcher	Ronquil/Searcher	0.1	0.2	0.1	0.2
Unidentified Blennidae	Blenny	0.1	0.3	a	0.1
Group: Greenling (Hexagrammidae)					
Hexagrammidae	Greenling	0.0	0.0	0.4	1.1
<i>Hexagrammos decagrammus</i>	Kelp greenling	0.6	1.0	0.0	0.0
<i>Ophiodon elongatus</i>	Lingcod	0.2	0.4	a	0.1
<i>Hexagrammos octogrammus</i>	Masked greenling	0.0	0.0	a	0.1
<i>Hexagrammos lagocephalus</i>	Rock greenling	0.2	0.5	0.1	0.3
<i>Hexagrammos stelleri</i>	White-spotted greenling	0.4	0.7	0.4	0.8
Group: Rockfish (Sebastes spp.)					
<i>Sebastes</i> spp.	Rockfish	0.0	0.0	0.1	0.5
Group: Poachers (Agonidae)					
<i>Anoplagonus inermis</i>	Smooth alligatorfish	0.0	0.0	a	0.1
<i>Podothecus acipenserinus</i>	Sturgeon poacher	0.0	0.0	a	0.1
<i>Pallasina barbata</i>	Tubenose poacher	0.1	0.2	a	0.2
Group: Gunnel (Pholidae)					
Unidentified gunnel	Gunnel	1.6	4.5	0.6	1.2
Group: Other					
<i>Anarrhichthys ocellatus</i>	Wolf-eel	0.0	0.0	0.0	0.0
<i>Ammodytes hexapterus</i>	Sandlance	4.7	20.8	2.7	13.9
<i>Remicola muscarum</i>	Kelp clingfish	0.0	0.0	a	0.1
Unidentified fish	Unidentified fish	0.2	0.4	a	0.3
Hermit Crab	Hermit Crab	0.2	0.4	0.8	3.1

Appendix 9.1. Common Murre population plot count windows between mid-incubation (MI) and the start of fledging (SOF).

Year	Gull Island					Chisik Island				
	hatch date	calculated		actual counts		hatch date	calculated		actual counts	
		MI	SOF	first	last		MI	SOF	first	last
1995	n.d.	25-Jul*	20-Aug*	26-Jul	9-Aug	11-Aug	25-Jul	20-Aug	22-Jul	5-Aug
1996	13-Aug	27-Jul	22-Aug	23-Jul	9-Aug	9-Aug	25-Jul	20-Aug	23-Jul	9-Aug
1997	9-Aug	25-Jul	24-Aug	24-Jul	14-Aug	7-Aug	21-Jul	18-Aug	20-Jul	18-Aug
1998	10-Aug	24-Jul	10-Aug	20-Jul	10-Aug	25-Aug	5-Aug	25-Aug	31-Jul	26-Aug
1999	12-Aug	28-Jul	23-Aug	31-Jul	16-Aug	16-Aug	31-Jul	19-Aug	31-Jul	22-Aug

* calculated windows for Gull Island in 1995 are based on Duck Island phenology.

Appendix 9.2. Rules used for analysis of Common Murre productivity data.

1. Sites without observations of eggs and postures that indicate the presence of an egg (see [3.], below) are excluded from all productivity analyses, whether or not a chick is seen.
2. Sites with data that are not logical (e.g., an observation of "no nest content" between sightings of a chick) are excluded from analyses.
3. Observation of an incubation posture (IP) during three nest checks without an intervening observation of (1) no nest content; or (2) one adult, standing, without an egg sighting; or (3) two adults, standing, without an egg sighting, constitutes an egg at that sight first "seen" on the day of the first IP. For this rule, an egg sighting is equivalent to an IP after the first IP (e.g., if there are sightings of "IP, E, E" then the egg was first "seen" on the date of the IP).
 - a. This rule is also used to determine the last day that an egg is present.
4. An observation of a brooding posture (BP) constitutes a chick first "seen" on that day.
 - a. This rule is also used to determine the last day that a chick is present.
5. Because laying and hatching of eggs and fledging of chicks are rarely observed during plot checks, the date that a nest-site changes status (i.e. 'no egg' to 'egg', 'egg' to 'chick', or 'chick' to 'no chick') is estimated to be the midpoint between the closest pre- and post-event observation dates. If the number of days between the two visits is even or is zero, the even Julian date closest to the midpoint is used in place of the midpoint.
 - a. On the day that a nest's status changes from 'egg' to 'chick', the chick's age is zero. The day that the status changes from 'chick' to 'no chick' is included in the chick's age. Simply subtracting the hatch date from the disappeared date will age the chick according to these rules.
 - b. Other studies have used similar conventions for fledging age:

Study	Observation interval (days)	Midpoints used for fledge date?	Minimum chick age for fledging (days)
Hunt, <i>et al.</i> 1981	3-4	no	16
Byrd 1989	3-5	no	15
Hatch and Hatch 1990	2	no	16
Dragoo and Dragoo 1994	3	yes	15
Roseneau <i>et al.</i> 1995	1-7	yes	15

6. In nests with relaid eggs, only the first egg is used for hatch date calculations and only the second for determination of breeding success.

7. Two methods are used to improve hatch date calculation precision.
 - a. Each nest-site with a 'data gap' of more than seven days between pre- and post-event observations for both laying and hatching is excluded from calculations involving hatch dates or chick ages. Since this rule acts only on nests that produce chicks, it has the potential to artificially reduce the chicks-to-eggs ratio. For analyses that involve the proportion of eggs that produced chicks, the number of egg-only nests should be reduced by the proportion of chick-nests that were excluded (e.g., if 15 percent of the nests with chicks were excluded, the number of egg-only nests is reduced by 15 percent).
 - b. If the data gap for laying is smaller than the gap for hatching, we calculate the hatch date by adding 32 days (the incubation period) to the laying date.
 8. Nests with more than 7 days between the last sighting of the chick and the first sighting of no chick are excluded from calculations involving the number of fledglings.
 9. Chicks that disappeared at age 15 days or older are considered fledged. Nests with data insufficient for determination of whether chicks died or fledged are excluded from fledging analyses.

Appendix 9.3. Information included on forms for collection and analysis of Common Murre productivity and nesting chronology data.

Data collection form- Each page of the field data collection forms is labeled with the island name and the year, species, and plot. Data fields (columns) are the nest-site and the plot check dates; data records (rows) are listed by nest-site. Observation codes are entered for each date, by nest-site. Forms are printed on waterproof paper.

Data analysis form- Each page of the form used for analysis of nest status change dates is labeled with the island name and the year, species, and plot. Each record in the form contains the calculations for one nest-site. Suggested data fields are:

Parameter abbreviation	Short for:	Data needed for calculation:
1. Nest-site		
2. ENL	Egg No Last:	the last 'no egg' observation date
3. EY1	Egg Yes 1st:	the first 'yes egg' observation date
4. EYL	Egg Yes Last:	the last 'yes egg' observation date
5. CY1	Chick Yes 1st:	the first 'chick yes' observation date
6. CYL	Chick Yes Last:	the last 'chick yes' observation date
7. CN1	Chick No 1st:	the first 'chick no' observation date
8. #E	# Eggs	the number of eggs produced on the plot
9. #C	# Chicks	a "0" or a "1."
10. ELR	Egg Lay Range	EY1 minus ENL
11. CHR	Chick Hatch Range	CY1 minus EYL
12. BHR	Best Hatch Range	Lowest of ELR and CHR
13. BHD	Best Hatch Date	$EYL + (CY1 \text{ minus } EYL) / 2$, unless $ELR < CHR$; then $BHD = ENL + 32 + (EY1 \text{ minus } ENL) / 2$
14. CGR	Chick Gone Range	$CN1 \text{ minus } CYL$
15. CGD	Chick Gone Date	if $CGR \leq 8$: $CYL + (CN1 \text{ minus } CYL) / 2$; otherwise leave blank
15. CGA	Chick Gone Age	if $CGR \leq 8$: $CGD \text{ minus } BHD$; otherwise leave blank
16. FA	Fledge Age	CGA if $CGA \geq 15$; otherwise leave blank
17. DA	Dead Age	CGA if $CGA < 15$; otherwise leave blank

Appendix 9.4. Common Murre chick meals by number (N) and percent composition (%) at Chisik Island, 1995-1999.

Prey items	Chisik Island										Total/Avg	
	1995		1996		1997		1998		1999			
	N	%	N	%	N	%	N	%	N	%		
No. meals observed	nd	nd	553		783		203		307		1846	
Osmeridae (total)			270	48.8	366	46.7	97	47.8	163	53.1	896 49.1	
Capelin <i>Mallotus villosus</i>			88		17		3		4		112	
Smelt spp.			182		349		94		159		784	
Pacific Sand lance <i>Ammodytes hexapterus</i>			117	21.2	93	11.9	56	27.6	109	35.5	375 24.0	
Gadidae (total)			29	5.2	7	0.9	0	0.0	0	0.0	36 1.5	
Other (total)			96	17.4	108	13.8	47	23.2	33	10.7	284 16.3	
Salmonids (Salmonidae)			35		81		43		16		175	
Pacific Herring <i>Clupea harengus pallasi</i>					1						1	
Sandfish <i>Trichodon trichodon</i>			35		10						45	
Prowfish <i>Zaprora silenus</i>			1		4						5	
Greenling (Hexagrammidae)			7		2						9	
Crescent Gunnel <i>Pholis laeta</i>											0	
Prickleback <i>Lumpenus</i> spp.			8		4				7		19	
Bathymasteridae											0	
Sculpin (Cottidae)			2								2	
Pacific Lamprey <i>Lampetra tridentatus</i>			2		4		1		3		10	
squid			6		2		3		7		18	
octopus											0	
Unknown			41	7.4	209	26.7	3	1.5	2	0.7	255 9.1	

Appendix 9.5. Common Murre chick meals by number (N) and percent composition (%) at Gull Island, 1995-1999.

Prey items	Gull Island											
	1995		1996		1997		1998		1999		Total/Avg	
	N	%	N	%	N	%	N	%	N	%	N	%
No. meals observed	35		132		326		552		130		1175	
Osmeridae (total)	2	5.7	27	20.5	99	30.4	204	37.0	73	56.2	405	29.9
Capelin <i>Mallotus villosus</i>			27		95		180		73		375	
Smelt spp.	2				4		24				30	
Pacific Sand lance <i>Ammodytes hexapterus</i>	21	60.0	17	12.9	95	29.1	111	20.1	31	23.8	275	29.2
Gadidae (total)	2	5.7	30	22.7	45	13.8	23	4.2	0	0.0	100	9.3
Other (total)	8	22.9	15	11.4	45	13.8	177	32.1	23	17.7	268	19.6
Salmonids (Salmonidae)	1		10		3		17		12		43	
Pacific Herring <i>Clupea harengus pallasi</i>	7		1		39		152		11		210	
Sandfish <i>Trichodon trichodon</i>											0	
Prowfish <i>Zadprora silenus</i>											0	
Greenling (Hexagrammidae)							2				2	
Crescent Gunnel <i>Pholis laeta</i>											0	
Prickleback <i>Lumpenus</i> spp.			3				4				7	
Bathymasteridae			1								1	
Sculpin (Cottidae)											0	
Pacific Lamprey <i>Lampetra tridentatus</i>											0	
squid					1		2				3	
octopus							2				2	
Unknown	2	5.7	43	32.6	42	12.9	37	6.7	3	2.3	127	12.0

Appendix 9.6. Common Murre chick meals by number (N) and percent composition (%) at the Barren Islands, 1995-1999.

Prey items	Barren Islands*											
	1995		1996		1997		1998		1999		Total/Avg	
	N	%	N	%	N	%	N	%	N	%	N	%
No. meals observed	389	100.0	236	100.0	421	100.0	408	100.0	186	100.0	1640	100.0
Osmeridae (total)	311	79.9	214	90.7	384	91.2	381	93.4	170	91.4	1460	87.3
Capelin <i>Mallotus villosus</i>	311		214		384		381		170		1460	
Smelt spp.											0	
Pacific Sand lance <i>Ammodytes hexapterus</i>	3	0.8	5	2.1	18	4.3	8	2.0	4	2.2	38	2.4
Gadidae (total)	27	6.9	6	2.5	5	1.2	7	1.7	2	1.1	47	3.6
Other (total)	25	6.4	1	0.4	1	0.2	8	2.0	4	2.2	39	2.4
Salmonids (Salmonidae)	2		1				8		4		15	
Pacific Herring <i>Clupea harengus pallasi</i>											0	
Sandfish <i>Trichodon trichodon</i>											0	
Prowfish <i>Zadprora silenus</i>	23										23	
Greenling (Hexagrammidae)											0	
Crescent Gunnel <i>Pholis laeta</i>											0	
Prickleback <i>Lumpenus</i> spp.											0	
Bathymasteridae											0	
Sculpin (Cottidae)											0	
Pacific Lamprey <i>Lampetra tridentatus</i>											0	
squid							1				1	
octopus											0	
Unknown	23	5.9	10	4.2	13	3.1	4	1.0	6	3.2	56	4.4

Appendix 9.7. Prey items in adult common murre stomachs collected at Chisik Island, lower Cook Inlet during 1995 - 1999. Mean numbers and mass of prey per bird are expressed as percent of total diet by number (N) and mass (M, in g). Frequency of prey occurrence (F) is reported as percent of stomachs that contained at least one of the prey. Empty stomachs are excluded from all calculations.

Prey items	Year of Collection															TOTAL/AVERAGE		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. stomachs examined	13			10			10			8			10			51		
No. empty stomachs	2			0			2			2			0			6		
Total prey in stomachs	85	186		188	342		90	360		75	164.1		76	364		514	1416	
Mean prey/stomach	6.5	14.3		18.8	34.2		9.0	36.0		9.4	20.51		7.6	36.4		14.5	25.1	
Osmeridae (total)	1.1	0.3	9.1	22.5	35.5	30.0	1.1	0.5	12.5	0.0	0.0	0.0	42.1	55.8	60.0	13.4	18.4	22.3
Capelin <i>Mallotus villosus</i>	1.1	0.3	9.1	3.7	8.1	20.0	1.1	0.5	12.5	0.0	0.0	0.0	42.1	55.8	60.0	9.6	12.9	20.3
Surf Smelt <i>Hypomesus pretiosus pretiosus</i>	0.0	0.0	0.0	18.7	27.4	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	5.5	2.0
Pacific Sand lance <i>Ammodytes hexapterus</i>	58.0	37.6	54.5	25.7	34.8	60.0	43.3	66.5	100.0	78.7	86.6	66.7	44.7	36.5	30.0	50.1	52.4	62.2
Gadidae (total)	38.7	39.3	81.8	19.8	10.6	30.0	41.1	14.6	75.0	0.0	0.0	0.0	1.3	0.6	10.0	20.2	13.0	39.4
Walleye Pollock <i>Theragra chalcogramma</i>	21.0	20.4	45.5	19.3	10.5	20.0	41.1	14.6	75.0	0.0	0.0	0.0	1.3	0.6	10.0	16.5	9.2	30.1
Pacific Cod <i>Gadus macrocephalus</i>																		
Saffron Cod <i>Eleginops gracilis</i>	16.6	15.8	27.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	3.2	5.5
Unidentified cod	1.1	3.2	18.2	0.5	0.1	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	5.6
Other (total)	1.1	0.3	9.1	31.5	19.1	5.0	14.4	18.4	37.5	4.0	13.4	16.7	6.6	4.3	40.0	11.5	11.1	21.7
Herring (<i>Clupea harengus</i>)																		
Pacific Sandfish <i>Trichodon trichodon</i>	0.0	0.0	0.0	3.7	12.4	30.0	1.1	1.7	12.5	2.7	9.1	16.7	3.9	3.8	20.0	2.3	5.4	15.8
Greenling (Hexagrammidae)							2.2	15.3	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5.1	8.3
Flatfish (Pleuronectidae)	1.1	0.3	9.1	4.3	2.5	20.0	11.1	1.4	25.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.8	10.8
Myctophid (Myctophidae)																		
Sculpin (Cottidae)																		
Mysid	0.0	0.0	0.0	23.0	2.7	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.5	2.0
Crab	0.0	0.0	0.0	0.5	1.5	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	2.0
Squid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	4.3	16.7	0.0	0.0	0.0	0.3	0.9	3.3
Pteropod																		
Polychaete	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	0.5	20.0	0.5	0.1	4.0
Unknown fish	1.1	22.5	9.1	0.5	0.1	10.0	0.0	0.0	0.0	17.3	0.1	33.3	5.3	2.7	40.0	4.8	5.1	18.5

Appendix 9.8. Prey items in adult common murre stomachs collected at Gull Island, lower Cook Inlet during 1995 - 1999. Mean numbers and mass of prey per bird are expressed as percent of calculations.

Prey items	Year of Collection															TOTAL/AVERAGE		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. stomachs examined	11			16			8			10			10			55		
No. empty stomachs	0			0			1			3			0			4		
Total prey in stomachs	393	965		810	1351		283	331		43	103		350	484		1879	3234	
Mean prey/stomach	35.7	87.7		50.6	84.4		40.4	47.3		4.3	10.3		35.0	48.4		35.6	47.1	
Osmeridae (total)	0.0	0.0	0.0	0.1	0.3	6.3	0.7	0.6	14.3	25.6	62.1	28.6	2.3	7.3	50.0	5.7	14.1	19.8
Capelin <i>Mallotus villosus</i>				0.1	0.3	6.3	0.7	0.6	14.3	25.6	62.1	28.6	2.3	7.3	50.0	7.2	17.6	24.8
Surf Smelt <i>Hypomesus pretiosus pretiosus</i>																		
Pacific Sand lance <i>Ammodytes hexapterus</i>	93.1	95.8	100.0	98.1	98.4	100.0	80.2	62.9	71.4	14.0	13.7	28.6	96.0	89.9	100.0	76.3	72.1	80.0
Gadidae (total)	6.9	4.2	81.8	1.6	1.3	19.0	15.0	32.8	85.7	0.0	0.0	0.0	0.6	1.0	20.0	4.8	7.9	41.3
Walleye Pollack <i>Theragra chalcogramma</i>	5.9	2.0	72.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.0	20.0	1.3	0.6	18.5
Pacific Cod <i>Gadus macrocephalus</i>	1.0	2.2	18.2	1.1	1.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	6.1
Saffron Cod <i>Eleginops gracilis</i>	0.0	0.0	0.0	0.0	0.0	0.0	10.2	27.6	57.1	0.0	0.0	0.0	0.0	0.0	0.0	2.0	5.5	11.4
Unidentified cod	0.0	0.0	0.0	0.5	0.3	6.3	5.0	5.2	42.9	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	9.8
Other (total)	0.0	0.0	0.0	0.1	0.1	6.3	3.9	3.7	28.6	16.3	24.2	57.1	0.9	1.7	20.0	4.2	5.9	22.4
Herring (<i>Clupea harengus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	21.3	57.1	0.3	0.4	10.0	2.9	4.3	13.4
Pacific Sandfish <i>Trichodon trichodon</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.7	14.3	0.0	0.0	0.0	0.6	1.2	10.0	0.3	0.8	4.9
Greenling (Hexagrammidae)																		
Flatfish (Pleuronectidae)	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.7	28.6	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	5.7
Myctophid (Myctophidae)																		
Sculpin (Cottidae)	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3	14.3	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	2.9
Mysid																		
Crab																		
Squid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	2.9	14.3	0.0	0.0	0.0	0.5	0.6	2.9
Pteropod																		
Polychaete	0.0	0.0	0.0	0.1	3.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.3
Unknown fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	44.2	0.1	42.9	0.3	0.2	10.0	8.9	0.1	10.6

Appendix 9.9. Prey items in adult common murre stomachs collected at the Barren Islands, lower Cook Inlet during 1995 - 1999. Mean numbers and mass of prey per bird are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of stomachs that contained at least one of the prey. Empty stomachs are excluded from all calculations.

Prey items	Year of Collection															TOTAL/AVERAGE		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. stomachs examined	10			9			10			10			5			44		
No. empty stomachs	3			1			3			3			0			10		
Total prey in stomachs	65	52		71	231		64	73		60	263		89	295		349	913	
Mean prey/stomach	6.5	5.2		7.9	25.6		6.4	7.3		6.0	26.3		17.8	59.0		8.7	21.6	
Osmeridae (total)	7.7	34.6	42.9	14.1	26.0	38.0	25.0	35.7	85.7	93.3	92.0	85.7	6.7	13.4	60.0	29.4	40.3	62.5
Capelin <i>Mallotus villosus</i>	7.7	34.6	42.9	14.1	26.0	37.5	25.0	35.7	85.7	93.3	92.0	85.7	6.7	13.4	60.0	29.4	40.3	62.4
Surf Smelt <i>Hypomesus pretiosus pretiosus</i>																		
Pacific Sand lance <i>Ammodytes hexapterus</i>	0.0	0.0	0.0	23.9	2.8	50.0	1.6	0.8	14.3	0.0	0.0	0.0	76.4	72.8	80.0	20.4	15.3	28.9
Gadidae (total)	92.3	65.4	100.0	45.1	59.8	88.0	62.5	59.3	57.1	0.0	0.0	0.0	14.6	10.4	40.0	42.9	39.0	57.0
Walleye Pollock <i>Theragra chalcogramma</i>	92.3	65.4	100.0	45.1	59.8	87.5	62.5	59.3	57.1	0.0	0.0	0.0	14.6	10.4	40.0	42.9	39.0	56.9
Pacific Cod <i>Gadus macrocephalus</i>																		
Saffron Cod <i>Eleginops gracilis</i>																		
Unidentified cod																		
Other (total)	0.0	0.0	0.0	16.9	11.4	63.0	10.9	4.3	42.9	6.7	8.0	42.9	0.0	0.0	0.0	6.9	4.7	29.8
Herring (<i>Clupea harengus</i>)																		
Pacific Sandfish <i>Trichodon trichodon</i>	0.0	0.0	0.0	1.4	6.1	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.2	2.5
Greenling (Hexagrammidae)																		
Flatfish (Pleuronectidae)	0.0	0.0	0.0	5.6	0.9	0.5	10.9	4.3	42.9	0.0	0.0	0.0	0.0	0.0	0.0	3.3	1.0	8.7
Myctophid (Myctophidae)	0.0	0.0	0.0	1.4	3.3	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.7	2.5
Sculpin (Cottidae)																		
Mysid																		
Crab																		
Squid	0.0	0.0	0.0	1.4	0.9	12.5	0.0	0.0	0.0	6.7	8.0	42.9	0.0	0.0	0.0	1.6	1.8	11.1
Pteropod	0.0	0.0	0.0	7.0	0.2	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	5.0
Polychaete																		
Unknown fish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	3.4	40.0	0.4	0.7	8.0

Appendix 9.10. Summary of Common Murre population plot counts for lower Cook Inlet colonies.

Location	Year	n	Estimate	s.d.	Source	Comments
Chisik Island *	1986		337		Nishimoto et al. 1987	plots 1-7
	1987		392		Beringer & Nishimoto 1988	plots 1-7
	1993		173		Slater et al. 1995	plots 1-7
	1994		342		Slater et al. 1995	plots 1-7
	1995	5	64	11.80	this study	plot 7**
		1	169	-***	this study	plots 4 & 7
		-	-	-	this study	plot 9
		-	-	-	this study	Duck Island plots
	1996	4	91	17.15	this study	plot 7
		4	153	11.95	this study	plots 4 & 7
		-	-	-	this study	plot 9
		-	-	-	this study	Duck Island plots
	1997	7	76	36.34	this study	plot 7
		7	138	45.23	this study	plots 4 & 7
		8	60	34.18	this study	plot 9
		8	219	13.02	this study	Duck Island plots
	1998	3	0	0.00	this study	plot 7
		3	69	7.00	this study	plots 4 & 7
		3	0	0.00	this study	plot 9
		2	249	31.82	this study	Duck Island plots
	1999	5	67	12.74	this study	plot 7
		5	187	57.81	this study	plots 4 & 7
		5	88	14.83	this study	plot 9
		3	227	27.07	this study	Duck Island plots
Gull Island	1985		49		Nishimoto & Thomas 1991	plots 1-3
	1986		67		Nishimoto & Thomas 1991	plots 1-3
			107			plots 1-8
	1987		103		Nishimoto & Thomas 1991	plots 1-3
			158			plots 1-8
	1988		84		Nishimoto & Thomas 1991	plots 1-3
			227			plots 1-8
			228			plots 1-10
	1989		112		Nishimoto & Thomas 1991	plots 1-3
			184			plots 1-8
			202			plots 1-10
	1990		136		Nishimoto & Thomas 1991	plots 1-3
			236			plots 1-8
			250			plots 1-10
	1992		196		Erikson, unpublished data	plots 1-3
			327			plots 1-8
			334			plots 1-10
	1993		60		Slater et al. 1995	plots 1-3
			315			plots 1-8
			328			plots 1-10
	1994		201		Slater et al. 1995	plots 1-3
			324			plots 1-8
			333			plots 1-10

Appendix 9.10. Summary of Common Murre population plot counts for lower Cook Inlet colonies.

Location	Year	n	Estimate	s.d.	Source	Comments
Gull Island	1995	8	197	16.28	This study	plots 1-3
		8	329	71.99		plots 1-8
		8	340	71.99		plots 1-10
	1996	6	145	8.09	This study	plots 1-3
		6	257	14.38		plots 1-8
		6	264	14.18		plots 1-10
	1997	10	223	20.94	This study	plots 1-3
		10	336	22.52		plots 1-8
		10	344	20.60		plots 1-10
	1998	10	203	46.65	This study	plots 1-3
		10	293	58.61		plots 1-8
		10	303	62.18		plots 1-10
	1999	6	254	18.29	This study	plots 1-3
		6	381	41.82		plots 1-8
		6	407	49.03		plots 1-10
60 Foot Rock	1985	23			Nishimoto & Beringer 1989	
	1986	33			Nishimoto & Beringer 1989	
	1987	34			Nishimoto & Beringer 1989	
	1988	20			Nishimoto & Beringer 1989	
	1989	25			Nishimoto & Thomas 1991	
	1990	18			Nishimoto & Thomas 1991	
	1993	23			Slater et al. 1995	
	1994	11			Slater et al. 1995	
	1995	1			This study	
	1998	0			This study	
Barren Island	1995	5	5225	854	****	8 plots
	1996	7	5648	396	****	8 plots
	1997	7	7139	795	****	8 plots
	1998	3	7275	402	****	8 plots
	1999	6	6245	242	****	8 plots

*includes Duck Island

**From 1995 - 1999, plots 1-7 were examined for all species, but murres were only present in plots 4 and 7.

*** There was only 1 count for plot 4 in 1995 and it was added to the counts for plot 7 to generate a mean for plots 4 & 7, therefore there is not a standard deviation for this count.

**** Data from: Kettle, A., D.G. Roseneau, G.V. Byrd. 2000. Barren Islands seabird studies, 2000, Exxon Valdez Oil Spill Restoration Project Final Report (Restoration Project 00163J), U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Service, Homer, Alaska.

Appendix 9.11. Summary of Common Murre colony population estimates for lower Cook Inlet.

Location	Year	n	Estimate	s.d.	Source	Comments
Chisik Island*	1970		20,000-25,000		Snarks 1971b	
	1970		22,500		Sowls 1985	
	1971		20,000-25,000		Snarks 1971b	
	1978		10,000		Jones & Peterson 1979	gross estimate; no plot counts
	1983		5000		Muhlberg 1984	
	1986		4104		Nishimoto et al. 1987	
	1991		7536		Erikson 1993	
	1993		2558		Slater et al. 1995	4 replicate counts made
	1994		3057		Slater et al. 1995	single count made (12 July)
	1995		2246		this study	single count, 3-19 July
	1996		---			
	1997		3500		Zador et al. 1997	
	1998		---			
	1999		---			
Gull Island	1976		3200		Erikson 1976	
	1984		2652			cited in Nishimoto & Beringer 1989
	1985		1994			cited in Nishimoto & Beringer 1989
	1988		5500		Nishimoto & Beringer 1989	birds flushed to complete count
	1989		5176		Nishimoto & Thomas 1991	
	1990		5075		Nishimoto & Thomas 1991	
	1991		1732		Erikson 1993	
	1995		8553		this study	single count, 30-31 July
	1996		---			
	1997		6068		Zador et al. 1997	single count
60-Foot Rock	1998		10400		this study	single count, 5 replicates, 25 May
	1999		10725		this study	single count, 5 replicates, 29 May
	1976		350		Erikson 1976	
	1984		234		Nishimoto et al. 1987	
	1985		91		Nishimoto et al. 1987	
	1986		99		Nishimoto et al. 1987	
	1987		221		Nishimoto & Beringer 1989	
	1988		155		Nishimoto & Beringer 1989	
	1989		232		Nishimoto & Thomas 1991	
	1990		190		Nishimoto & Thomas 1991	
	1993		150		Slater et al. 1995	
	1994		140		Slater et al. 1995	

*includes Duck Island

Appendix 10.1. Black-legged Kittiwake calculated population plot count windows, defined as the period between mid-incubation (MI) and the start of fledging (SOF) and the actual range of count dates used at Chisik and Gull Islands, 1995-1999.

Year	Gull Island					Chisik Island				
	hatch date	calculated		actual count		hatch date	calculated		actual count	
		MI	SOF	first	last		MI	SOF	first	last
1995	14-Jul	4-Jul	20-Jul	8-Jun	8-Jul	8-Jul	4-Jul	28-Jul	4-Jul	26-Jul
1996	9-Jul	26-Jun	16-Jul	28-Jun	18-Jul	2-Jul	19-Jun	13-Jul	27-Jun	16-Jul
1997	7-Jul	22-Jun	17-Jul	28-Jun	19-Jul	9-Jul	27-Jun	8-Jul	26-Jun	8-Jul
1998	15-Jul	30-Jun	28-Jul	28-Jun	28-Jul	4-Jul	23-Jun	4-Jul	23-Jun	9-Jul
1999	10-Jul	27-Jun	19-Jul	25-Jun	18-Jul	10-Jul	19-Jun	9-Jul	21-Jun	3-Jul

Appendix 10.2. Summary of Black-legged Kittiwake population plot counts at breeding colonies in Lower Cook Inlet.
Counts are the mean of all count-days for a season (n = count-days).

Location	Year	n	Adults	s.d.	n	Nests	s.d.	Source	Comments
Chisik *	1986		1498			1201		Nishimoto et al. 1987	completed in July
	1987					626		Beringer & Nishimoto 1988	completed in July
	1993		919			569		Slater et al. 1995	completed in July
	1994		1045			996		Slater et al. 1995	
	1995	6	761	230.52	6	596	68.25	this report	
	1996	5	756	274.40	5	586	194.23	this report	
	1997	6	532	65.13	6	385	98.01	this report	
	1998	5	514	157.24	3	622	75.80	this report	
	1999	3	609	27.02	3	491	44.02	this report	
Gull Island	1984		145			80		Nishimoto et al. 1987	plots 1-3
	1985		149			56		Nishimoto et al. 1987	plots 1-3
	1986		224			158		Nishimoto et al. 1987	plots 1-3
			993			769			plots 1-8
	1987		213			101		Beringer & Nishimoto 1988	plots 1-3
			725			300			plots 1-8
	1988		240			189		Nishimoto & Beringer 1989	plots 1-3
			1289			949			plots 1-8
			1454			1071			plots 1-10
	1989		234			164		Nishimoto & Thomas 1991	plots 1-3
			1082			875			plots 1-8
			1219						plots 1-10
	1990		218			164		Nishimoto & Thomas 1991	plots 1-3
			1156			817			plots 1-8
			1301			929			plots 1-10
	1992		191			135		Erikson, upub. Data	plots 1-3
			1027			600			plots 1-8
			1165			685			plots 1-10
	1993		222			94		Slater et al. 1995	plots 1-3
			909			515			plots 1-8
			1025			571			plots 1-10
	1994		204			138		Slater et al. 1995	plots 1-3
			926			751			plots 1-8
			1067			847			plots 1-10
	1995	7	270	33.47	5	147	24.93	this report	plots 1-3
		7	1185	87.22	5	680	133.13		plots 1-8
		7	1340	96.30	5	775	149.00		plots 1-10
	1996	5	220	22.29	4	155	8.62	this report	plots 1-3
		5	978	71.63	4	673	56.95		plots 1-8
		5	1109	82.17	4	740	63.27		plots 1-10
	1997	7	215	9.85	7	153	6.68	this report	plots 1-3
		7	1044	68.17	7	710	32.65		plots 1-8
		7	1195	66.53	7	796	66.53		plots 1-10
	1998	7	230	33.17	3	145	8.50	this report	plots 1-3
		7	1074	110.30	3	558	30.99		plots 1-8
		7	1203	117.96	3	630	32.88		plots 1-10
	1999	6	206	10.34	2	156	2.83	this report	plots 1-3
		6	971	54.09	2	746	6.36		plots 1-8
		6	1094	60.55	2	843	9.90		plots 1-10

Appendix 10.2. Summary of Black-legged Kittiwake population plot counts at breeding colonies in Lower Cook Inlet.
Counts are the mean of all count-days for a season (n = count-days).

Location	Year	n	Adults	s.d.	n	Nests	s.d.	Source	Comments
60-Foot Rock	1985					35		Nishimoto & Beringer 1989	
	1986		96			75		Nishimoto & Beringer 1989	
	1987		71			31		Nishimoto & Beringer 1989	
	1988		112			82		Nishimoto & Beringer 1989	
	1989		98			90		Nishimoto & Thomas 1991	
	1990		101			88		Nishimoto & Thomas 1991	
	1993		65			47		Slater et al. 1995	
	1994		103			89		Slater et al. 1995	
	1995		119			89		Zador et al. 1997	
Barren Island	1995	15	201	8.7			**		4 plots
	1996	12	183	8.2			**		4 plots
	1997	12	196	11.2			**		4 plots
	1998	8	180	27.4			**		4 plots
	1999	10	205	18.5			**		4 plots

* includes Duck Island.

** Data from : Kettle, A., D.G. Roseneau, G.V. Byrd. 2000. Barren Islands seabird studies, 2000, Exxon Valdez Oil Spill Restoration Project Final Report (Reostoration Project 00163J), U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Service, Homer, Alaska.

Appendix 10.3. Summary of Black-legged Kittiwake whole-colony counts in lower Cook Inlet.

Colony	Year	Adults	Nests	Source	Comments
Chisik*	1936	25,000		Murie 1959	
	1970	20,000		Snarski 1971a	May only include the SW colony
	1971	47,690		Snarski 1974	
	1978	28,000		Jones and Peterson 1979	Includes chicks, counted in early August
	1979	28,000		Jones et al. 1980	
	1983	20,000		Kafka 1984	Estimate of "Tuxedni Bay area"
	1985	18,170		Nishimoto, unpublished data	Counted prior to nest building
	1986	27,228		Nishimoto 1987	
	1993	14,191		Slater et al. 1995	
	1994	17,804		Slater et al. 1995	
	1995	16,504	13,303	Zador et al. 1997	Single count 2-19 July
	1997		13,341	Zador et al. 1997	Single count 19 June
	1999		11,063	this study	Single count 21 June
Gull	1976	3194			
	1984		4204	Nishimoto et al. 1987	
	1985	8202		Nishimoto et al. 1987	
	1990	6986	5684	Nishimoto and Thomas 1991	
	1995	8166	5719	Zador et al. 1997	Single count 13 July
	1996		5152	Zador et al. 1997	Single count 29 June
	1997		4435	Zador et al. 1997	Single count 26-27 June
	1998		4800	this study	Single count 17-18 June
	1999	5809	4495	this study	Single count 23-24 June
60' Rock	1976	68		Erikson 1976	
	1984		199	Nishimoto et al. 1987	
	1985		177	Nishimoto et al. 1987	
	1986	289		Nishimoto et al. 1987	
	1987	250		Nishimoto and Beringer 1989	
	1988	414		Nishimoto and Beringer 1989	
	1989	351		Nishimoto and Thomas 1991	
	1990	391		Nishimoto and Thomas 1991	
	1993	186		Slater et al. 1995	
	1994	294		Slater et al. 1995	
	1995	439		Zador et al. 1997	Single count 8 June
	1998		146	this study	Single count 16 June

* includes Duck Island.

Appendix 10.4. Summary of Black-legged Kittiwake productivity and productivity indexes at Chisik, Gull and *Barren Islands, lower Cook Inlet, Alaska

Colony	Year	Nests		Productivity			Dates of Index Counts			Comments		Source		
		index	Intensive	index	mean	s.d.	n	intensive	mean	s.d.	n	nests	chicks	
Chisik Island**	1970				0.00		7							
	1971		74		0.00		7							
	1973			"very good"			7							
	1978		115		0.02		7							
	1979		60		0.36		7							
	1983		90		0.00		7							
	1986		1201		0.25		7							
	1987		626		0.00		7							
	1993		341		0.00		7							
	1994						7							
	1995		247		0.02	0.06	12							
	1996	2489***	92	0.05	1	0.04	0.06	7	6/27	8/6				
	1997	13,341	142	0.01	1	0.02	0.04	10	6/19	8/7				
Gull Island	1998	14,655	129	0.00	1	0.00	0.00	9	6/14					
	1999	11,063	129	0.09	1	0.00	0.00	9	6/21	8/22				
	1984	80	0.80		3									
	1985	428	0.33		7									
	1986	769	0.69		6									
	1987	300	0.03		8									
	1988	1,071	0.63		10									
	1989	985	0.53		10									
	1990	929	0.47		10									
	1992****	685	0.36		10									
60-Foot Rock*****	1993	608	0.10		10									
	1994	847	0.21		10									
	1995	5,719	178	0.40		0.32	0.28	6	7/13	8/9				
	1996	5,152	268	0.56		0.50	0.31	10	6/29	8/4				
	1997	4,435	307	0.46		0.60	0.36	11	6/26, 6/27	8/3, 8/4				
	1998	4,800	295	0.28		0.32	0.22	10	6/17, 6/18	8/12				
	1999	4,495	305	n.d.		0.65	0.11	10	6/23, 6/24					
	1985	177	0.10		1									
	1986	230	0.40		1									
	1987	106	0.00		1									
Barren Islands	1988	280	0.58		1									
	1989	281	0.16		1									
	1990	301	0.04		1									
	1993	156	0.06		1									
	1994	230	0.01		1									
	1995	89	0.21*****		1				6/8					
Barren Islands	1997	181	0.13		2				6/22	8/12	plots 1-2			
	1998	146	0.03		1				6/18	8/20				
	1995				0.45	0.14	11							
	1996				0.04	0.06	11							
	1997				0.31	0.13	11							
Barren Islands	1998				0.72	0.20	10							
	1999				0.62	0.25	11							

*Data from: Kettle, A., D.G. Roseneau, G.V. Byrd. 2000. Barren Islands seabird studies, 2000, Exxon Valdez Oil Spill Restoration Project Final Report (Restoration Project 00163), U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Service, Homer, Alaska.

**includes Duck Island, plots 1-7 from 1970 - 1994

***Duck Island only

****single count of nests and chicks on 15 August

*****entire island counted, except in 1997

*****nesting success (ratio of nests with chicks to total nests)

Appendix 10.5. Prey items in Black-legged Kittiwake regurgitations (chick meals) collected at the Barren Islands, lower Cook Inlet, during 1995-1999. Mean numbers and mass of prey per sample are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of samples that contained at least one of the prey. Frequencies of groups are the sum of individual frequencies. Barrens data from Data from : Kettle, A., D.G. Roseneau, G.V. Byrd. 2000. Barren Islands seabird studies, 2000, Exxon Valdez Oil Spill Restoration Project Final Report (Reostoration Project 00163J), U.S. Fish and Wildlife Service, Alaska Maritime National Wildlife Service, Homer, Alaska.

Prey items	Barren Islands															TOTAL		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. regurgitations examined	69			84			82			28			105			368		
Total prey in samples	631	1553		528	2131		1809	1583		227	575		600	1272		3795	7114	
Mean prey/sample	9.1	22.5		6.3	25.4		22.1	19.3		8.1	20.5		5.7	12.1		10.3	19.3	
Osmeridae (total)	106	996.4	42	42	626.5	21	43	261.2	20	48	238.7	17	124	446.9	38	363	2569.7	138
Capelin (<i>Mallotus villosus</i>)	106	996.4	42	41	588.5	20	40	230.7	17	38	186.7	13	124	446.9	38	349	2449.2	130
Unidentified smelt	0	0.0	0	1	38.0	1	3	30.5	3	10	52.0	4	0	0.0	0	14	120.5	8
Pacific herring (<i>Clupea harengus</i>)	0	0.0	0	7	77.7	5	10	105.5	6	3	3.6	2	0	0.0	0	20	186.8	13
Pacific sand lance (<i>Ammodytes hexapterus</i>)	63	206.6	25	238	1119.9	38	416	1013.7	61	168	275.5	23	401	701.0	69	1286	3316.8	216
Gadidae (total)	15	263.5	14	1	15.0	1	2	7.1	2	7	14.4	2	1	6.1	1	26	306.1	20
Walleye pollock (<i>Theragra chalcogramma</i>)	6	217.6	5	1	15.0	1	1	1.0	1	1	2.4	1	0	0.0	0	9	236.0	8
Pacific cod (<i>Gadus macrocephalus</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Pacific tomcod (<i>Micromesistius proximus</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Unidentified cod	9	45.9	9	0	0.0	0	1	6.1	1	6	12.0	1	1	6.1	1	17	70.1	12
Other fish (total)	0	0.0	0	1	15.0	1	15	96.4	10	1	43.0	1	6	59.0	3	23	213.4	15
Eulachon	0	0.0	0	0	0.0	0	1	2.4	1	0	0.0	0	0	0.0	0	1	2.4	1
Surf smelt	0	0.0	0	0	0.0	0	1	8.6	1	0	0.0	0	0	0.0	0	1	8.6	1
Salmonid	0	0.0	0	1	15.0	1	6	59.0	3	1	43.0	1	6	59.0	3	14	176.0	8
Sculpins	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Pacific sandfish (<i>Trichodon trichodon</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Sablefish (<i>Anoplopoma fimbria</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Prickleback (<i>Lumpenus fabricii</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Greenling (<i>Hexagrammos</i> spp.)	0	0.0	0	0	0.0	0	7	26.4	5	0	0.0	0	0	0.0	0	7	26.4	5
Lumpsucker	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Unidentified fish	9	0.0	6	8	258.8	3	0	0.0	0	0	0.0	0	1	8.5	1	18	267.3	10
Invertebrates (total)	438	86.8	6	231	17.7	2	1323	99	5	0	0.0	0	67	50.3	3	2059	253.9	16
Shrimp (<i>Pandalus</i> spp.)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Euphausiids	434	86.8	3	231	17.7	2	1320	99.1	4	0	0.0	0	67	50.3	3	2052	253.9	12
Amphipod	1	0.0	1	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	1	0.0	1
Pteropod	0	0.0	0	0	0.0	0	3	0.0	1	0	0.0	0	0	0.0	0	3	0.0	1
Polychaete	1	0.0	1	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	1	0.0	1
Squid	2	0.0	1	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	2	0.0	1

Appendix 10.6. Prey items in Black-legged Kittiwake regurgitations (chick meals) collected at Gull Island, lower Cook Inlet, during 1995-1999. Mean numbers and mass of prey per sample are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of samples that contained at least one of the prey.

Prey items	Gull Island															TOTAL		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. regurgitations examined	40			74			100			101			68			383		
Total prey in samples	92	227.6		684	835.7		1020	1719.6		454	1677.1		364	1406.3		2614	5866.3	
Mean prey/sample	2.3	5.7		9.2	11.3		10.2	17.2		4.5	16.6		5.4	20.7		6.8	15.3	
Osmeridae (total)	12	24.3	8	8	16.2	4	3	9.7	3	20	101.1	8	4	24.8	3	47	176.1	26
Capelin (<i>Mallotus villosus</i>)	12	24.3	8	8	16.2	4	3	9.7	3	17	97.1	5	4	24.8	3	44	172.1	23
Unidentified smelt	0	0.0	0	0	0.0	0	0	0.0	0	3	4.0	3	0	0.0	0	3	4.0	3
Pacific herring (<i>Clupea harengus</i>)	0	0.0	0	8	62.1	7	11	347.0	11	21	395.5	17	11	161.3	8	51	965.9	43
Pacific sand lance (<i>Ammodytes hexapterus</i>)	78	195.7	32	263	660.0	56	538	1269.5	83	400	1251.5	82	346	1202.7	63	1625	4579.4	316
Gadidae (total)	1	3.2	1	0	0.0	0	3	54.8	2	7	23.0	1	2	7.0	1	13	88.0	5
Walleye pollock (<i>Theragra chalcogramma</i>)	1	3.2	1	0	0.0	0	1	2.8	1	7	23.0	1	2	7.0	1	11	36.0	4
Pacific cod (<i>Gadus macrocephalus</i>)	0	0.0	0	0	0.0	0	2	52.0	1	0	0.0	0	0	0.0	0	2	52.0	1
Pacific tomcod (<i>Microgadus proximus</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Unidentified cod	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Other fish (total)	0	0.0	0	0	0.0	0	2	7.0	2	5	5.0	1	1	10.5	1	8	22.5	4
Salmonid	0	0.0	0	0	0.0	0	1	5.0	1	0	0.0	0	1	10.5	1	2	15.5	2
Sculpins	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Pacific sandfish (<i>Trichodon trichodon</i>)	0	0.0	0	0	0.0	0	1	2.0	1	0	0.0	0	0	0.0	0	1	2.0	1
Sablefish (<i>Anoplopoma fimbria</i>)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Pickleback (<i>Lumpenus fabricii</i>)	0	0.0	0	0	0.0	0	0	0.0	0	5	5.0	1	0	0.0	0	5	5.0	1
Greenling (<i>Hexagrammos</i> spp.)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Lumpsucker	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Unidentified fish	1	4.4	1	12	53.6	8	4	4.0	4	1	0.0	1	0	0.0	0	18	62.0	14
Fish offal	0	0.0	0	17	11.2	6	6	5.0	6	3	2.0	3	0	0.0	0	26	18.2	15
Invertebrates (total)	0	0.0	0	376	32.7	5	459	34.6	6	0	0.0	0	0	0.0	0	835	67.3	11
Shrimp (<i>Pandalus</i> spp.)	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0
Euphausiids	0	0.0	0	376	32.7	5	459	34.6	6	0	0.0	0	0	0.0	0	835	67.3	11

Appendix 10.7. Prey items in Black-legged Kittiwake regurgitations (chick meals) collected at Chisik Island, lower Cook Inlet, during 1995-1999. Mean numbers and mass of prey per sample are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of samples that contained at least one of the prey.

Prey items	Chisik Island															TOTAL		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. regurgitations examined	n.d.			19			27			17			3			66		
Total prey in samples		112	271.3		143	531.6		73	240.5		27	24.3		355	1067.7			
Mean prey/sample		5.9	14.3		5.3	19.7		4.3	14.1		9.0	8.1		5.4	16.2			
Osmeridae (total)	0	10	47.9	6	0	0.0	0	9	39.3	5	0	0.0	0	19	87.2	11		
Capelin (<i>Mallotus villosus</i>)		10	47.9	6	0	0.0	0	0	0.0	0	0	0.0	0	10	47.9	6		
Unidentified smelt		0	0.0	0	0	0.0	0	9	39.3	5	0	0.0	0	9	39.3	5		
Pacific herring (<i>Clupea harengus</i>)	0	0	0.0	0	4	61.0	4	0	0.0	0	0	0.0	0	4	61.0	4		
Pacific sand lance (<i>Ammodytes hexapterus</i>)	0	45	185.9	10	127	378.8	19	59	180.2	13	27	24.3	3	258	769.2	45		
Gadidae (total)	0	0	0.0	0	2	19.0	1	0	0.0	0	0	0.0	0	2	19.0	1		
Walleye pollock (<i>Theragra chalcogramma</i>)		0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0		
Pacific cod (<i>Gadus macrocephalus</i>)		0	0.0	0	1	18.0	1	0	0.0	0	0	0.0	0	1	18.0	1		
Pacific tomcod (<i>Microgadus proximus</i>)		0	0.0	0	1	1.0	1	0	0.0	0	0	0.0	0	1	1.0	1		
Unidentified cod		0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0		
Other fish (total)	0	3	25.1	3	2	32.4	2	2	21.0	2	0	0.0	0	7	78.5	7		
Salmonid		0	0.0	0	0	7.0	0	2	21.0	2	0	0.0	0	2	28.0	2		
Sculpins		0	0.0	0	1	7.4	1	0	0.0	0	0	0.0	0	1	7.4	1		
Pacific sandfish (<i>Trichodon trichodon</i>)		2	15.7	2	1	18.0	1	0	0.0	0	0	0.0	0	3	33.7	3		
Sablefish (<i>Anoplopoma fimbria</i>)		0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0		
Pickleback (<i>Lumpenus fabricii</i>)		0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0		
Greenling (<i>Hexagrammos</i> spp.)		0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0	0	0.0	0		
Lumpsucker		1	9.3	1	0	0.0	0	0	0.0	0	0	0.0	0	1	9.3	1		
Unidentified fish	0	1	0.4	1	2	18.6	2	0	0.0	0	0	0.0	0	3	19.0	3		
Fish offal	0	0	5.0	0	1	13.1	1	0	0.0	0	0	0.0	0	1	18.1	1		
Invertebrates (total)	0	53	7.1	5	5	9.7	1	1	0.5	2	0	0.0	0	59	17.3	8		
Shrimp (<i>Pandalus</i> spp.)		1	3.3	1	5	9.7	1	1	0.5	1	0	0.0	0	7	13.5	3		
Euphausiids		52	3.8	4	0	0.0	0	0	0.0	0	0	0.0	0	52	3.8	4		

Appendix 10.8 Prey items in adult Black-legged Kittiwake stomachs collected at the Barren Islands, lower Cook Inlet during 1995-1999. Mean numbers and mass of prey per bird are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of stomachs that contained at least one of the prey. Empty stomachs are excluded from all calculations.

Appendix 10.9. Prey items in adult Black-legged Kittiwake stomachs collected at Gull Island, lower Cook Inlet during 1995 - 1999.

Mean numbers and mass of prey per bird are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of stomachs that contained at least one of the prey. Empty stomachs are excluded from all calculations.

Prey items	Year of Collection															TOTAL/AVERAGE		
	1995			1996			1997			1998			1999			N	M	F
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. stomachs examined	10			14			11			n.d.			12			47		
No. empty stomachs	0			0			0						3			3		
Total prey in stomachs	53	144.5		66	126.2		60	55.2		76	113.0		255	439				
Mean prey/stomach	5.3	14.5		4.7	9.0		5.5	5.0		6.3	9.4		5.5	9.5				
Osmeridae (total)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	13.0	27.3				20.0	56.5	44.4	6.2	17.4	17.9
Capelin (<i>Mallotus villosus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	5.0	13.0	27.3				20.0	56.5	44.4	6.2	17.4	17.9
Rainbow smelt (<i>Osmerus mordax</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Eulachon (<i>Thaleichthys pacificus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Unidentified smelt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Pacific sand lance (<i>Ammodytes hexapterus</i>)	96.2	92.4	100.0	98.5	92.1	100.0	65.1	61.1	81.8				76.0	37.3	77.8	84.0	70.7	89.9
Gadidae (total)	3.8	7.6	10.0	0.0	0.0	0.0	1.7	0.2	9.0				0.0	0.0	0.0	1.4	1.9	4.8
Walleye pollock (<i>Theragra chalcogramma</i>)	3.8	7.6	10.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.9	1.9	2.5
Pacific cod (<i>Gadus macrocephalus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod (<i>Eleginops gracilis</i>)	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.2	9.0				0.0	0.0	0.0	0.4	0.0	2.3
Unidentified cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Other fish (total)	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	18.0				2.0	4.4	11.1	5.5	6.1	7.3
Salmonid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Herring (<i>Clupea harengus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				2.0	4.4	11.1	0.5	1.1	2.8
Pacific sandfish (<i>Trichodon trichodon</i>)	0.0	0.0	0.0	0.0	0.0	0.0	20.0	20.0	18.0				0.0	0.0	0.0	5.0	5.0	4.5
Flatfish (Pleuronectidae)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Unidentified fish	0.0	0.0	0.0	1.5	7.9	7.1	0.0	0.0	0.0				2.0	1.8	11.1	0.9	2.4	4.6
Invertebrates (total)	0.0	0.0	0.0	0.0	0.0	0.0	8.3	5.8	36.0				0.0	0.0	0.0	2.1	1.4	9.0
Shrimp (<i>Pandalus</i> spp.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Crab	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Pteropod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Polychaete	0.0	0.0	0.0	0.0	0.0	0.0	5.0	5.4	18.0				0.0	0.0	0.0	1.2	1.3	4.5
Snail	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.4	18.0				0.0	0.0	0.0	0.8	0.1	4.5

Appendix 10.10. Prey items in adult Black-legged Kittiwake stomachs collected at Chisik Island, lower Cook Inlet during 1995 - 1999.

Mean numbers and mass of prey per bird are expressed as percent of total diet by number (N) and mass (M in g). Frequency of prey occurrence (F) is reported as percent of stomachs that contained at least one of the prey. Empty stomachs are excluded from all calculations.

Prey items	Year of Collection															TOTAL/AVERAGE		
	1995			1996			1997			1998			1999					
	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F	N	M	F
No. stomachs examined	11			10			13			n.d.			9			43		
No. empty stomachs	6			5			4						2			17		
Total prey in stomachs	43	40.0		26	26.9		34	88.5					17.0	71.0		120	226	
Mean prey/stomach	3.9	3.6		2.6	2.7		2.6	6.8					1.9	7.9		2.7	5.2	
Osmeridae (total)	0.0	0.0	0.0	7.7	5.2	20.0	6.1	21.1	22.2				17.6	25.4	42.9	7.8	12.9	21.3
Capelin (<i>Mallotus villosus</i>)	0.0	0.0	0.0	7.7	5.2	20.0	0.0	0.0	0.0				17.6	25.4	42.9	6.3	7.7	15.7
Rainbow smelt (<i>Osmerus mordax</i>)	0.0	0.0	0.0	0.0	0.0	0.0	3.1	10.0	11.1				0.0	0.0	0.0	0.8	2.5	2.8
Eulachon (<i>Thaleichthys pacificus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Unidentified smelt	0.0	0.0	0.0	0.0	0.0	0.0	3.1	11.2	11.1				0.0	0.0	0.0	0.8	2.8	2.8
Pacific sand lance (<i>Ammodytes hexapterus</i>)	86.2	81.3	100.0	84.6	50.2	60.0	35.1	17.6	22.2				64.8	70.4	14.3	67.7	54.9	49.1
Gadidae (total)	9.2	16.3	40.0	0.0	0.0	0.0	17.6	7.6	11.1				0.0	0.0	0.0	6.7	6.0	12.8
Walleye pollock (<i>Theragra chalcogramma</i>)	6.9	11.0	40.0	0.0	0.0	0.0	5.7	1.8	11.1				0.0	0.0	0.0	3.2	3.2	12.8
Pacific cod (<i>Gadus macrocephalus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Saffron cod (<i>Eleginops gracilis</i>)	2.3	5.2	10.0	0.0	0.0	0.0	11.8	5.7	11.1				0.0	0.0	0.0	3.5	2.7	5.3
Unidentified cod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Other fish (total)	4.6	2.5	40.0	3.8	26.0	20.0	3.1	0.6	11.1				0.0	0.0	0.0	2.9	7.3	17.8
Salmonid	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Herring (<i>Clupea harengus</i>)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Pacific sandfish (<i>Trichodon trichodon</i>)	0.0	0.0	0.0	3.8	26.0	20.0	0.0	0.0	0.0				0.0	0.0	0.0	1.0	6.5	5.0
Flatfish (Pleuronectidae)	4.6	2.5	40.0	0.0	0.0	0.0	3.1	0.6	11.1				0.0	0.0	0.0	1.9	0.8	12.8
Unidentified fish	0.0	0.0	0.0	0.0	0.0	0.0	3.1	2.2	11.1				17.6	4.2	42.9	5.2	1.6	13.5
Invertebrates (total)	0.0	0.0	0.0	3.8	18.6	20.0	35.1	50.8	44.4				0.0	0.0	0.0	9.7	17.3	16.1
Shrimp (<i>Pandalus</i> spp.)	0.0	0.0	0.0	0.0	0.0	0.0	35.1	50.8	44.4				0.0	0.0	0.0	8.8	12.7	11.1
Crab	0.0	0.0	0.0	3.8	18.6	20.0	0.0	0.0	0.0				0.0	0.0	0.0	1.0	4.6	5.0
Pteropod	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Polychaete	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
Snail	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0

Appendix 11.1. Boundaries of Pigeon Guillemot colony census sites in Kachemak Bay.

These photos will aid future researchers in replicating our pigeon guillemot colony censuses. The boundaries of all census sites are indicated on a chart in Figure 11.2. When we established these sites we used natural landmarks, such as partially submerged rocks, points, or the edge of cliffs, to mark boundaries.

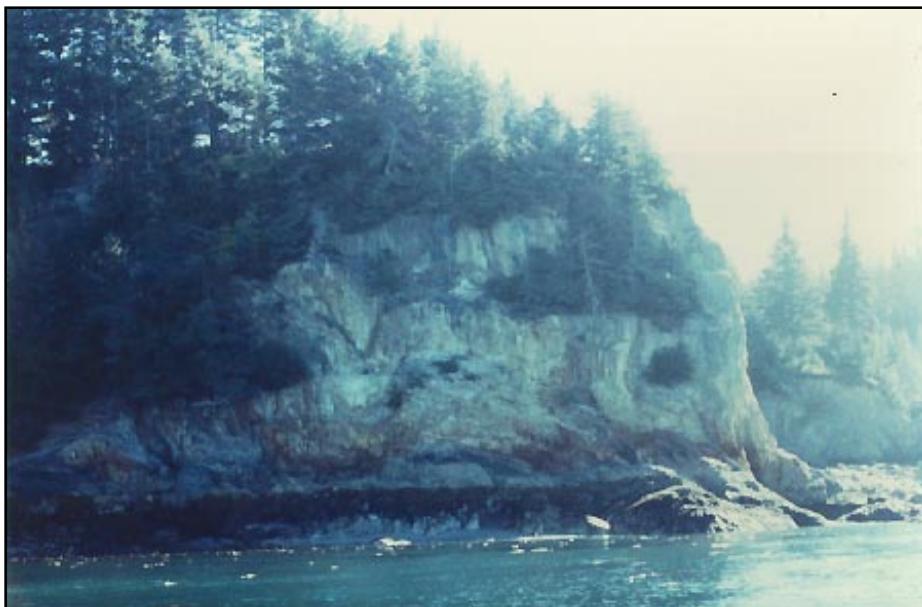


Figure A11.1. Census site #3, Lemon Cliffs.



Figure A11.2. Heart Rock. In 1995 the nest at the top of this rock was hit by a predator (a mink?). All that was left was some feathers and the heart of an adult guillemot. The right hand side forms the southern boundary of site #5, Seldovia Bay.

Figure A11.3. Right hand arrow indicates the rocks in the water which form the boundary between sites #5 and #6, sub-Seldovia. Left hand arrow indicates the point (marked by light and shadow) which forms the boundary between #6 and #7, Seldovia Pt.



Figure A11.4. Another view of the boundary between sites #6 and #7.

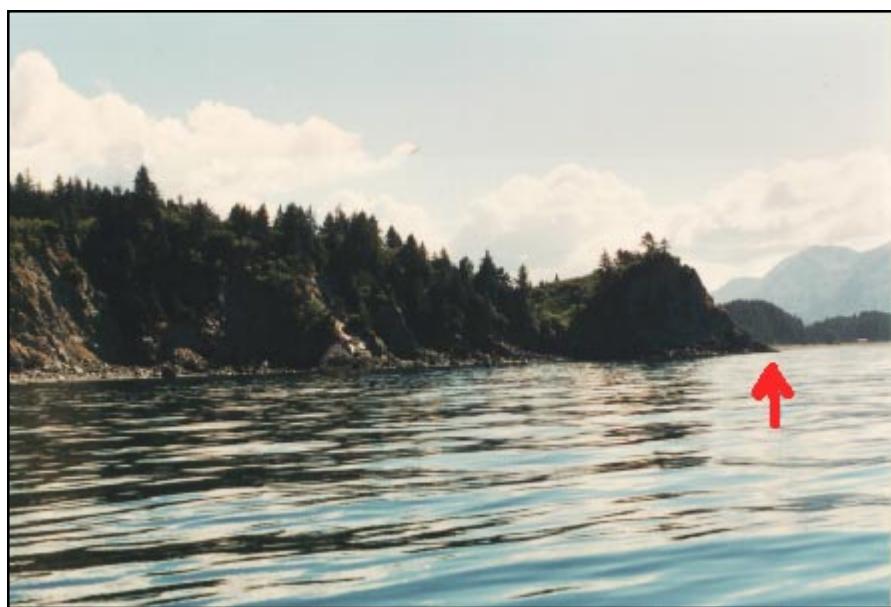


Figure A11.5. Arrow indicates the rocks projecting into the water which form the northern boundary of site #7, Seldovia Pt.



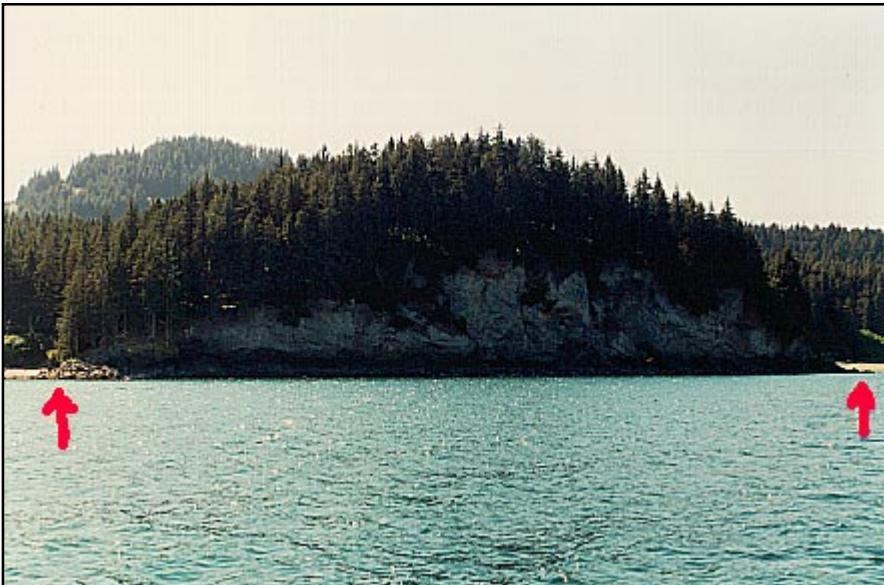


Figure A11.6. Arrows indicate the boundaries of site #8, Kasitsna Cliffs.



Figure A11.7. This rock forms the western boundary of site #9, Hesketh I.



Figure A11.8. The arrow points to the rocks that protrude into the water to form the eastern boundary of site #9, Hesketh I. This boundary is also marked by the point where the beach between the high cliffs begins (out of sight in this photo).

Figure A11.9. Arrow marks the northern boundary of site #10, SW Yukon.



Figure A11.10. Arrow indicates line of rocks that mark southern boundary of site #10, SW Yukon.



Figure A11.11. The arrow indicates the edge of the stack that marks the western boundary of site #11, Yukon I.





Figure A11.12. This point marks the boundary of sites #11 and #12, Sub-Yukon.

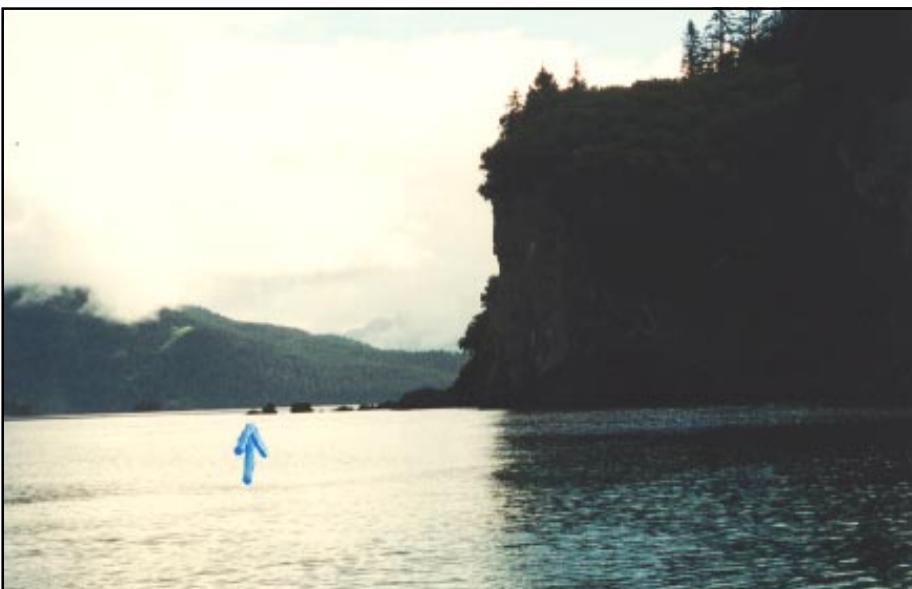


Figure A11.13. Arrow indicates line of rocks forming the southern boundary of site #12, Sub-Yukon.



Figure A11.14. This arrow marks the western boundary of site #13, S. Neptune Bay. This site consists of a single small cove - note that the arrow indicates a rocky point that is indistinguishable from the point behind it in this photo.

Figure A11.15. The left-hand arrow indicates a tree that leans out over the cliff and marks the western boundary of site #13. The right-hand arrow indicates a nest active in 1995.



Figure A11.16. Arrow indicates the western end of cliff, which forms western boundary of site #14, N. Neptune Bay.



Figure A11.17. Right-hand arrow marks headland (with ADF&G regulatory marker) that marked the eastern boundary of site #14 in 1996 and 1997. In 1998 and 1999 we expanded the site to the headland marked by the left-hand arrow.





Figure A11.18. Arrow marks the northern boundary of site #15, China Poot Bay.

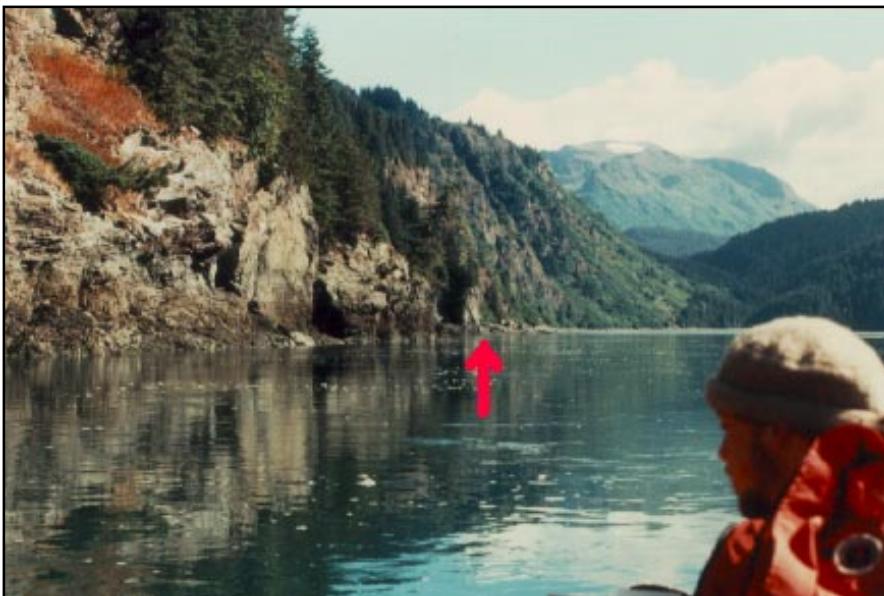


Figure A11.19. Arrow marks the southern end of site #15. The boundary is formed by the end of the cliffs occupied by this colony.



Figure A11.20. Arrow indicates southern end of site# 16, Moosehead Pt., China Poot Side. Also known as the “Motherlode”, this site had the highest concentration of accessible nests in our study.

Figure A11.21. Indicated point forms the boundary between site #16 and #17, Moosehead N. Side.



Figure A11.22. This rock forms the boundary between site #17 and site #18, Moosehead Pt. Peterson side.



Figure A11.23. Indicated rock (submerged at high tide) marks the eastern boundary of site #18.





Figure A11.24. Arrow points to a distinctive rock horn that marks the southern boundary of site #20, the Nose.



Figure A11.25. This point forms the boundary between site #20 and #21, Peterson Pt.



Figure A11.26. These rocks (submerged at high tide) form the eastern boundary of site #21.

Figure A11.27. Eastern boundary of site #22, Ismailof I.



Figure A11.28. Western boundary of site #22.



Figure A11.29. Southern boundary of site #24, Triangle Rock.

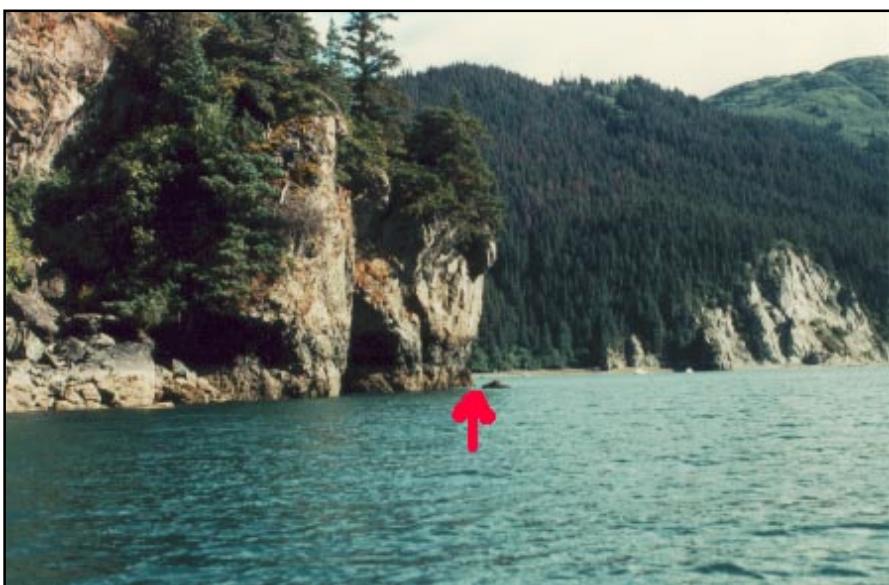




Figure A11.30. North boundary of site #24.



Figure A11.31. This bulge of rock forms the south boundary of site #25, Goshawk.

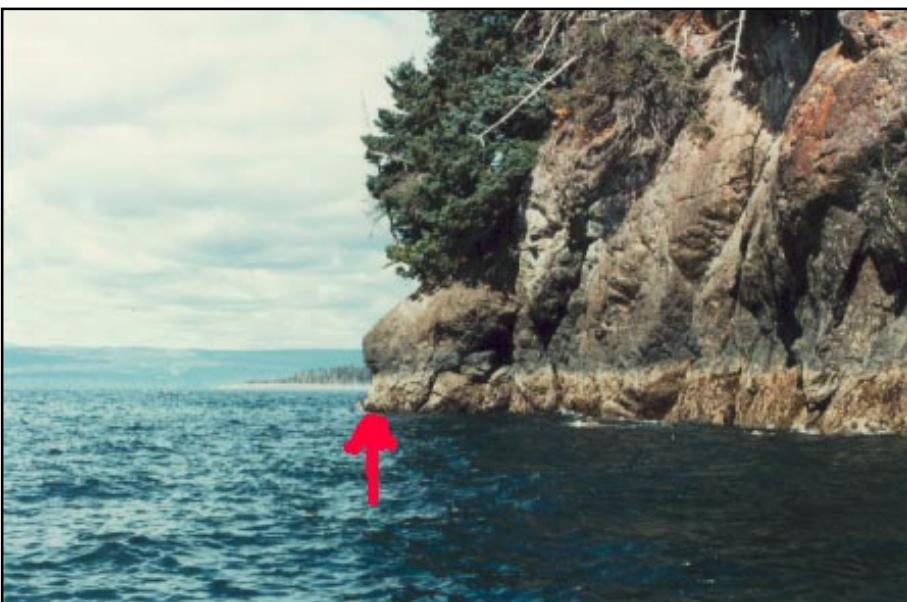


Figure A11.32. North boundary of site #25.

Appendix 12.1. Morphometrics of breeding adult Horned Puffins at Duck Island.

Date	Wing	Tarsus	Headbill	Culmen	Depth	Width	Edge *	Mass (g)	Status
8-Jun-98	197	32.4	85.7	49.1				450	
27-Jun-98	192	31.5	84.2	50.3	43.2	13.1	27.8	535	incubating
1-Aug-98	197	32.0	84.8	49.1	41.8	15.1	28.1	575	chick-rearing
1-Aug-98	191	31.7	83.9	47.1	41.1	13.6	26.4	550	chick-rearing
1-Aug-98	209	32.1	85.5	50.4	45.0	14.9	26.3	620	chick-rearing
19-Aug-98	195	31.3		52.4	44.4	14.3	29.2	555	chick-rearing
19-Aug-98	194	29.8		44.6	36.6	12.8	25.8	455	chick-rearing
19-Aug-98	194	31.2	78.3	49.4	41.5	12.1	26.3	530	chick-rearing
20-Aug-98	200	31.4	80.8	47.9	43.9	13.2	24.9	585	chick-rearing
21-Aug-98	220	31.4	84.0	52.4	42.1	14.0	28.9	560	chick-rearing
21-Aug-98	219	30.7	79.8	49.3	38.4	14.1	27.5	486	chick-rearing
21-Aug-98	207	30.2	83.0	48.2	40.2	12.1	25.9	525	chick-rearing
22-Aug-98	194	30.4	82.4	49.8	42.0	13.4	28.2	530	chick-rearing
23-Aug-98	201	30.2	80.0	47.4	41.2	13.9	26.2	525	chick-rearing
24-Aug-98	196	30.1	80.8	49.6	41.0	13.1	26.9	525	chick-rearing
27-Aug-98	192	30.6	76.9	47.9	38.5	13.2	26.9	470	chick-rearing
11-Aug-99	195	32.5	80.6	47.7	42.7	13.1	27.5	413	chick-rearing
11-Aug-99	191	31.2	80.8	47.3	40.6	14.1	28.3	535	chick-rearing
11-Aug-99	190	27.3	78.1	47.6	39.9	12.1	25.5	490	chick-rearing
13-Aug-99	191	32.1	87.1	51.0	42.4	11.5	28.5	595	chick-rearing
17-Aug-99	200	31.5	80.1	47.5	42.7		25.0	522	chick-rearing
17-Aug-99	204	30.9	81.6	48.0	39.6	12.2	28.0	522	chick-rearing
17-Aug-99	199	33.2	84.4	48.2	40.2	13.6	27.0	542	chick-rearing
17-Aug-99	198	30.2	82.8	49.8	40.1	12.7	27.1	512	chick-rearing
17-Aug-99	195	31.0	79.9	48.0	40.7	13.0	26.9	562	non-breeder
17-Aug-99	200	31.4	79.6	48.3	40.5	13.2	26.5	502	non-breeder
17-Aug-99	205	34.1	84.1	51.8	44.7	13.1	27.8	610	chick-rearing
17-Aug-99	198	31.4	79.8	47.4	39.3		27.1	507	?
17-Aug-99	200	31.4	85.6	51.1	44.8		27.6	587	chick-rearing
17-Aug-99	207	32.9	83.9	51.4	43.0		26.7	552	chick-rearing
17-Aug-99	197	32.0	83.2	48.5	44.4		26.3	522	chick-rearing
17-Aug-99	203	31.9	84.2	50.8	44.6		28.0	542	chick-rearing
23-Aug-99	193	32.0	84.9	52.0	42.7	13.0	28.1	540	chick-rearing
23-Aug-99	200	31.8	82.4	49.0	42.4	12.7	27.1	505	chick-rearing
23-Aug-99	188	30.0	83.2	47.9	38.5	11.9	21.6	485	chick-rearing
23-Aug-99	189	31.6	83.9	46.6	41.8	13.8	26.6	530	chick-rearing
27-Aug-99	191	31.7	83.4	50.8	44.4	14.4	26.9	535	chick-rearing
27-Aug-99	202	38.8	83.6	50.4	41.1	15.3	28.6	595	chick-rearing

Note: Structural measurements in mm, mass in grams. 1998 experimental adults are not included. *

'edge', 'depth' and 'width' refer to bill measurements.

Appendix 13.1. Summary of glaucous-winged gull population estimates on plots in lower Cook Inlet colonies.

Location	Year	n	Estimate *	s.d.	Source	Comments
Chisik Island** (plots 1-7)	1986		18		Nishimoto et al. 1987	
	1987		33		Beringer & Nishimoto 1988	
	1993		9		Slater et al. 1995	
	1994		10		Slater et al. 1995	
	1995	9	5	4.7	this study	***plots 3-4
		10	93	30.7	this study	North & Snug Harbor plots (new)
	1996	6	11(2)	5.3(2.1)	this study	***plots 3,4 & 7
		6	121(26)	35.9(12.1)	this study	North & Snug Harbor plots
	1997	5	14	6	this study	***plot 3
		9	94	32.6	this study	North & Snug Harbor plots
Gull Island (plots 1-10)	1988		30		Nishimoto & Beringer 1989	
	1990		24		Nishimoto & Thomas 1991	
	1992		22		Erikson, unpublished data	single count on 15 Aug
	1993		20(1)		Slater et al. 1995	
	1994		2		Slater et al. 1995	
	1995	5	25	6.6	this study	
	1996	4	11	3.8	this study	
	1997	6	18(1)	2.4(0.5)	this study	
	1998	8	21(2)	3.7(0.5)	this study	
	1999	8	23(3)	6.6(1.3)	this study	
60-Foot Rock (plots 1-2)	1987		10		Nishimoto & Beringer 1989	
	1988		15		Nishimoto & Beringer 1989	
	1989		18		Nishimoto & Beringer 1990	
	1990		16(2)		Nishimoto & Thomas 1991	
	1993		20(12)		Slater et al. 1995	
	1994		17(4)		Slater et al. 1995	
	1995		21(15)		Zador et al. 1997	
	1996		---			
	1997		---			
	1998		---			
	1999		---			

*estimate is the mean of total plot counts, number of nests are in parentheses

** includes Duck Island

***data reported for Chisik 1995-1999 are for only those plots where gulls were present. However, plots 1-7 were checked periodically for the presence of gulls.

Appendix 13.2. Glaucous-winged Gull calculated population plot count windows, defined as the period between mid-incubation and the start of fledging and the actual range of count dates used at Chisik and Gull Islands, 1995-1999. Mid-incubation and start of fledging dates are estimated, based on known hatch dates (see Table 13.1 for sample sizes and error values) combined with typical incubation (27-29 d) and chick-rearing (37-53 d) durations for the species*.

Year	Gull Island					Chisik Island				
	hatch date	calculated		actual		hatch date	calculated		actual	
		mid-incubation	start of fledge	first count	last count		mid-incubation	start of fledge	first count	last count
1995	2-Jul	18-Jun	8-Aug	21-Jun	9-Aug	n.d.	13-Jun	5-Aug	1-Jul	5-Aug
1996	4-Jul	20-Jun	10-Aug	7-Jul	22-Jul	27-Jun	13-Jun	3-Aug	27-Jun	20-Jul
1997	30-Jun	16-Jun	6-Aug	28-Jun	13-Jul	26-Jun	12-Jun	2-Aug	16-Jun	5-Jul
1998	30-Jun	16-Jun	6-Aug	23-Jun	1-Aug	24-Jun	10-Jun	31-Jul	17-Jun	24-Jul
1999	8-Jul	24-Jun	14-Aug	25-Jun	4-Aug	5-Jul	21-Jun	11-Aug	21-Jun	5-Aug

*Verbeek, N.A.M. 1993. Glaucous-winged Gull (*Larus glaucescens*). In The Birds of North America, No. 59 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington D.C.: The American Ornithologists' Union.

**no GWGU productivity in 1995, as a result calculated windows are based on GWGU chronology on Gull Island 1995 and the observation that the chronology on Duck Island 1996-1999 was on average 5 days earlier than for Gull Island 1995 - 1999.

Appendix 13.3. Summary of glaucous-winged gull population estimates in selected lower Cook Inlet colonies.

Location	Year	Estimate *	Source	Comments
Chisik Island **	1978	1500-2000	Jones et al. 1980	
	1983	1500-2000	Muhlberg 1984	Tuxedni Bay area
	1993	1000	Slater et al. 1995	
	1995	1884(229)	Zador et al. 1997	single count 7-22 Jul
	1996	---		
	1997	81***	this study	15-Jun
	1998	634	this study	14-Jun
	1999	---		
Gull Island	1976	216	Erikson 1976	
	1984	200	Nishimoto et al. 1987	
	1985	442	Nishimoto et al. 1987	
	1987	592	Nishimoto & Beringer 1989	
	1988	1054	Nishimoto & Beringer 1989	
	1989	762	Nishimoto & Thomas 1991	
	1990	713	Nishimoto & Thomas 1991	
	1995	500	Zador et al. 1997	estimate, 8 Jun
	1996	---		
	1997	1222	this study	17-Jun
60-Foot Rock	1998	825	this study	10-Jun
	1999	---		
	1976	64	Erikson 1976	
	1984	21	Nishimoto et al. 1987	
	1986	113	Nishimoto et al. 1987	max count, 31 Jul
	1987	86	Nishimoto & Beringer 1989	
	1988	96	Nishimoto & Beringer 1989	
	1989	95	Nishimoto & Thomas 1991	
	1990	80	Nishimoto & Thomas 1991	
	1993	98	Slater et al. 1995	
	1994	60	Slater et al. 1995	
	1995	79	Zador et al. 1997	single count 8 Jun
	1996	---		
	1997	---		
	1998	---		
	1999	---		

* numbers of nests are in parentheses, ** includes Duck Island, *** Duck Island only

Appendix 13.4. Summary of Double-crested (DCCO), Pelagic (PECO), and red-faced cormorant (RFCO) population estimates on plots in lower Cook Inlet colonies.

Location	Year	Estimate*						Source	Comments		
		DCCO**			PECO***		RFCO****				
		n	mean	s.d.	n	mean	s.d.	n	mean	s.d.	Unknown species
Chisik Island (plots 1 -7)	1986		1(1)		0			0			4(2)
	1987		1(1)		0			---			Beringer & Nishimoto 1988
	1993		0		0			0			Slater et al. 1995
	1994		0		0			0			Slater et al. 1995
	1995		0		0			0			Zador et al. 1997
	1996		0		0			0			this study
	1997		0		0			0			this study
	1998	5	37(32)	0.9(4.0)		---		---			this study
	1999		---		0			---			this study
											plots 1-6
Gull Island	1986		0		55(20)			0			Nishimoto & Thomas 1991
	1987		0		44(15)			0			Nishimoto & Thomas 1991
	1988		0		43(21)			0			Nishimoto & Thomas 1991
			0		49(22)			0			plots 1-10
	1989		0		30(16)			0			Nishimoto & Thomas 1991
			0		33(16)			0			plots 1-10
	1990		0		38(21)			0			Nishimoto & Thomas 1991
			0		39(21)		1(1)				plots 1-10
	1992		0		6(5)			0			Erikson, unpub. Data
			0		6(5)		1(1)				plots 1-8
	1993		0		39(25)			0			Slater et al. 1995
			0		41(26)			0			plots 1-8
	1994		0		43(26)			0			Slater et al. 1995
			0		44(27)			0			plots 1-10
	1995		0	2	43(29)	0.7(1.4)		0			Zador et al. 1997
			0	2	44(30)	0.0(2.1)		0			plots 1-10
60-Foot Rock	1996		0	5	31(20)	3.9(0.5)		---			this study
			0	5	31(20)	3.9(0.5)		---			plots 1-8
	1997		0	7	21(12)	3.1(0.8)		0			this study
			0	7	23(12)	3.0(0.4)		0			plots 1-8
	1998		0	8	18(10)	3.1(2.6)		0			this study
			0	8	21(10)	3.4(2.6)		0			plots 1-10
	1999		0	11	18(11)	5.1(0.3)		0			this study
			0	11	21(12)	5.3(0.3)		0			plots 1-8
											plots 1-10

*estimate is the mean of counts pooled for plots, nests in parentheses, ** Double-crested Cormorant, ***Pelagic Cormorant, ****Red-faced Cormorant

Appendix 13.5. Calculated and actual count windows for Pelagic Cormorant population plots on Gull Island 1995-1999.

Year	Gull Island					
	calculated		actual (individuals)		actual (nests)	
	mid-incubation	start of fledge	first count	last count	first count	last count
1995	13-Jul	25-Aug	18-Jul	2-Aug	18-Jul	2-Aug
1996	24-Jun	11-Aug	2-Jul	22-Jul	2-Jul	18-Jul
1997	7-Jul	13-Aug	8-Jul	28-Jul	8-Jul	28-Jul
1998	25-Jun	14-Aug	3-Jul	8-Aug	3-Jul	8-Aug
1999	2-Jul	22-Aug	2-Jul	16-Aug	2-Jul	16-Aug

Appendix 13.6. Summary of Double-crested (DCCO), Pelagic (PECO), and red-faced cormorant (RFCO) population estimates in selected lower Cook Inlet colonies.

Location	Year	Estimate*			Source	Comments
		DCCO	PECO	RFCO		
Chisik Island**	1970	500	20-30	---	Snarski 1971c	
	1971	500	20-30(1)	---	Snarski 1971c	
	1973	---	(2)	---	Snarski 1974	
	1978	common	7(0)	---	Jones & Peterson 1979	
	1983	150(17)	---	---	Muhlberg 1984	+150 roosting on Duck Island +150 unidentified cormorants roosting on SE
	1986	(16)	(2)	---	Nishimoto et al. 1987	
	1987	50+(1)	0	---	Beringer & Nishimoto	derived from partial 1988 island count
	1993	160	30(12)	---	Slater et al. 1995	entire island
	1994	81	2	0	Slater et al. 1995	NE bluffs not in count
	1995	113(45)	12(7)	0	Zador et al. 1997	min. pop size
	1996	18(8)	4(2)	0	this study	min. pop size
	1997	(15)	0	---	this study	
	1998	---	---	---	this study	
	1999	---	0	---	this study	entire island
Tuxedni River***	1999	258(61)	---	---	this study	
Gull Island	1976	0	222	62	Erikson 1976	entire island
	1984	0	(54)	(4)	Nishimoto et al. 1987	entire island
	1985	0	105	14	Nishimoto et al. 1987	entire island
	1986	0	272(111)	45(14)	Nishimoto et al. 1987	entire island
	1987	0	296(103)	56(17)	Beringer & Nishimoto 1988	entire island
	1988	0	(130)	(8)	Nishimoto & Beringer 1989	entire island
	1989	0	(129)	(15)	Nishimoto & Thomas 1991	entire island
	1990	0	246(111)	29(15)	Nishimoto & Thomas 1991	entire island
	1995	0	194(92)	27(12)	Zador et al. 1997	entire island
	1996	0	138(87)	16(8)	this study	entire island
	1997	0	141(74)	16(6)	this study	entire island
	1998	0	(58)	(9)	this study	entire island
	1999	---	---	---	this study	
60-Foot Rock	1976	0	0	0	Erikson 1976	
	1984	0	30	---	Nishimoto et al. 1987	
	1985	0	28	0	Nishimoto et al. 1987	
	1986	1	13	0	Nishimoto et al. 1987	
	1987	0	9	0	Nishimoto & Beringer 1989	
	1988	0	2	0	Nishimoto & Beringer 1989	
	1989	0	39(3)	0	Nishimoto & Thomas 1991	
	1990	0	62(6)	1(1)	Nishimoto & Thomas 1991	
	1993	1(1)	45(39)	0	Slater et al. 1995	
	1994	0	29(0)	0	Slater et al. 1995	
	1995	0	35	0	Zador et al. 1997	single count 6/8
	1996	---	---	---		
	1997	---	---	---		
	1998	---	---	---		
	1999	---	---	---		

*number of nests in parentheses, ** includes Duck Island, *** Colony in the Tuxedni River channel about 0.75 miles past the entrance to horsefly slough, counted only in 1999. Not a part of Chisik Island

Appendix 13.7. Count windows used for Tufted Puffin population plot counts as compared to estimated breeding chronology determined from chick measurements in 1997, Gull Island.

Year	mid-incubation	first count	hatch date	last count	start of fledge
1997	25-Jun	28-Jun	17-Jul	28-Jul	31-Aug
1998	25-Jun	28-Jun	17-Jul	8-Aug	31-Aug
1999	25-Jun	2-Jul	17-Jul	16-Aug	31-Aug